The Mining Journal

ndon, July 21, 1961

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Editor
U. Baliol Scott
Deputy Editor
A. Graham Thomson
Assistant Editor
R. Bowran

Display Advertisement Manager
E. S. Hooper

Circulation
Robert Budd

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E. Baliol Scott (*Chairman*) U. Baliol Scott (*Managing*)
G. A. Baliol Scott R. A. Ellefsen

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Is Congo Unity in Sight?

MORE than a year has elapsed since the birth of the Congo Republic on June 30, 1960. This huge territory, populated by ethnologically divided and in some instances mutually antagonistic peoples, was launched into self-government without adequate preparation. Its leaders, with few exceptions, were tribal rulers incapable of the national approach which alone could have given direction and authority to the Central Government. Political and administrative experience were almost wholly lacking.

In such inauspicious circumstances it would have been a miracle indeed if the advent of self-government had not been followed by widespread disorders. These were sparked off by the mutiny of the Force Publique which was accompanied by violence and atrocities in many parts of the Congo and led to the large-scale exodus of the European population in July.

Powerless to assert its authority, the Central Government was confronted with a new crisis on July 15, when M. Tshombe announced the secession of Katanga, source of three-fifths of the Congo's wealth, and appointed his own army and police chiefs. Katanga's breakaway was followed by the emergence of M. Kalonji's "Diamond State" in the Kasai, while a third independent government was formed at Stanleyville by the pro-Communist M. Gizenga, formerly deputy to the late M. Lumumba.

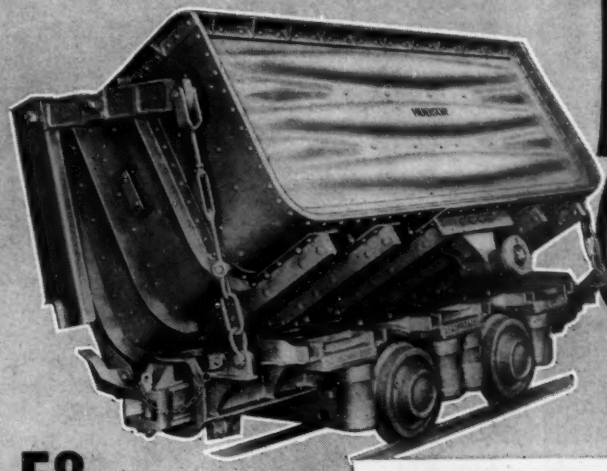
In order to restore law and order U.N. forces were dispatched to the Congo, but their efforts to do so were hampered by instructions to maintain an attitude of strict neutrality between the various Congolese factions—a policy reflecting the dissension within U.N.O. itself.

Tribal jealousies apart, the chief obstacle to a unified Congo is the divergence of interests between the "have" and "have-not" states, the latter being those with little or no mineral wealth.

Copper, the mainstay of Katanga's economy, brings the government frs. 100,000,000 a month in export royalties alone. The political situation has had little effect on production, which rose last year to 302,000 tonnes, a gain of 20,000 tonnes. The 7 per cent increase was achieved despite a voluntary reduction of 10 per cent from the end of September. This situation reflects the close co-operation which has existed between the Tshombe government and the mining companies. Union Minière's own confidence in the future is indicated by an expansion programme which envisages the commissioning of two additional copper concentrators in mid-1962 and early 1964 respectively, as well as by the decision to build a new cobalt plant at Luilu.

In general, mining's crucial position in the Congo's economy appears to be appreciated by the other leaders. It was due in no small measure to M. Kalonji's assistance that Béceka was able to produce 13,150,000 ct. of boart last year despite suspension of output from August 27 to October 20 because of tribal fighting. In the Kivu region, which is controlled by the forces of M. Gizenga, the tin mines have been working almost without interruption since independence, but exports have been held up by transport difficulties.

MINE CARS



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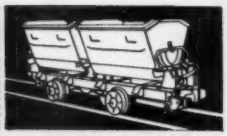

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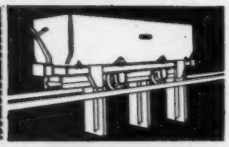

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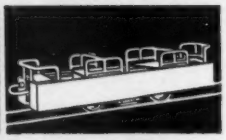

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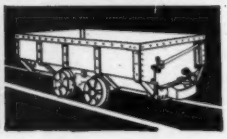

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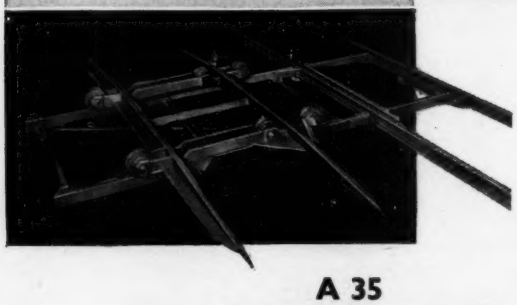

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Lorries and petrol supplies are apt to be requisitioned by marauding soldiers, while shipments via Stanleyville and Matadi have been interrupted by the severing of all contacts between the Central Government and Orientale Province. Symétain has been in much the same boat, but was recently able to resume exports on a modest scale via Matadi.

On the whole, it can be said that, apart from Forminiére, whose output has been severely curtailed by local disorders, the mining industry has come through the first and possibly most critical year of Congo independence in remarkably good shape. As long as outbreaks of tribal fighting persist, however, and the Congolese leaders remain at loggerheads with one another, the risk of tribal fighting with consequent disorganization of production and/or exports and perhaps damage to plant and equipment will remain, nor can the possibility of a major conflagration be dismissed.

Particularly encouraging, therefore are the efforts which the heads of the rival governments have lately been making to reach agreement among themselves for some loose Federation of Congolese states. Such, broadly, was the aim of the Coquilhatville conference towards the end of April, which led to the arrest of M. Tshombe by Leopoldville government forces when he attempted to walk out of the talks. M. Tshombe, who has since been freed, went so far as to sign an agreement removing the frontiers between his state and the rest of the Congo. On his return to Elisabethville, however, he repudiated this agreement, which he said he had been forced to sign in order to secure his release.

A few days ago the Leopoldville and Stanleyville governments were reported to have reached agreement with a view to forming a government of national unity. It now seems possible that M. Tshombe might also agree to participate in a national government, for he has expressed his willingness to send deputies to the Congolese Parliament on the firm condition that there was a preliminary meeting of leaders in the Congo.

The explanation for this change of tune appears to be that Katanga's chances of retaining its independence were seriously weakened during the two months that M. Tshombe was in prison. Belgium's new government has quietly switched its support to U.N.'s policy of Congo unity, while U.N. troops have occupied key positions which have more or less neutralized the Katanga army. According to M. Munongo, Katanga's Minister of the Interior, the United Nations have given Katanga a virtual 36-hour ultimatum to declare the northern part of the territory a neutral zone and to withdraw some army units.

At the same time, tribal warfare has cut off Katanga from many of the foods and industrial supplies it used to get from other Congo states. These now have to be imported from such areas as the Central African Federation or Nyasaland, or brought by roundabout routes from other Congolese provinces and even from the northern areas of Katanga itself—now controlled by Baluba tribesmen in revolt against M. Tshombe according to the *Wall Street Journal*. Katanga must spend $16,000,000 a year more on transportation than in the days when goods come in by the now-closed "National route" via rail and the Congo River. At the same time Katanga's thirst for imports combined with the high salaries paid to top officials and their mushrooming staffs, have set off a wave of inflation. The cost of consumer goods is reported to have risen by an estimated 25 per cent since secession and threatens to go higher still.

Despite Katanga's mineral wealth it is thus conceivable that economic pressure could give the break-away province the final push into rejoining the Congo. Moreover, Union Minière itself is now said to be in favour of a pact with the central government that would reopen the Congo's transport routes. At present Katanga's copper output is handled by Rhodesian Railways, which carry it across the Federation to the port of Beira in Mozambique, and by the Benguela Railway to Lobito. Now it is feared that Angolan revolts might close the Benguela railway, in which case Union Minière would be forced to curtail its shipments unless the route to Matadi was reopened.

Despite present difficulties, Katanga has a strong and relatively stable economy, supported by a revenue of about $50,000,000 a year from mineral production, and its people are well-off by Congolese standards. If political and economic developments are, in fact, trending in the direction of a reunited Congo, M. Tshombe and his advisers are clearly in a strong position to negotiate with the Leopoldville and Stanleyville governments. Their terms for reunion would doubtless include a massive amount of self-government within the federation and virtually full control over the tax and tariff income produced by the mines. Some very hard bargaining is to be expected, therefore, before an acceptable basis for reunification can emerge.

If M. Tshombe proves too intransigent, however, Katanga will find itself isolated both economically and politically. M. Mahmoud Khiari, special representative of the U.N. Secretary General, has gone so far as to state that the U.N. would not oppose a military action of a legal Congolese government to deal with the secession of the Province. One way or another, it would appear that for Katanga the sands of independence may be running out.

NEW PROJECTS FOR CHILE

Against a background of unrealistic proposals and labour unrest, concrete plans for the expansion of Chile's great copper mining industry continue to be announced.

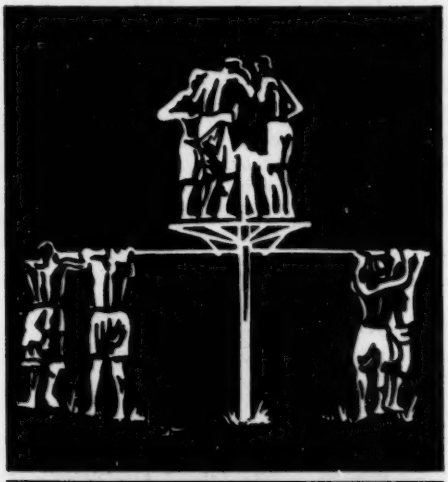
For the past eighteen months the government has been discussing investments totalling $325,000,000 with the copper companies. If approved by the government, these investments would increase Chile's copper output by 100,000 tonnes. That the proposals have hung fire for such a long period is thought to indicate the government's sensitivity to pressure against foreign investments from the left.

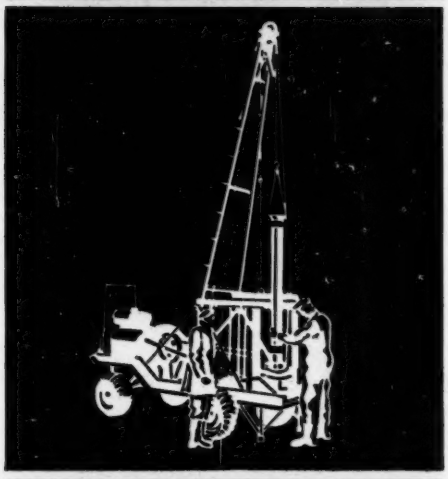
Within the past few days the Christian Democratic Party has presented to Parliament a bill for the creation of a new Copper Corporation, which would take over world marketing of all Chilean copper. Another Bill requiring all copper-producing companies in Chile to refine their total production in the country has been presented by the Chilean Communist Party.

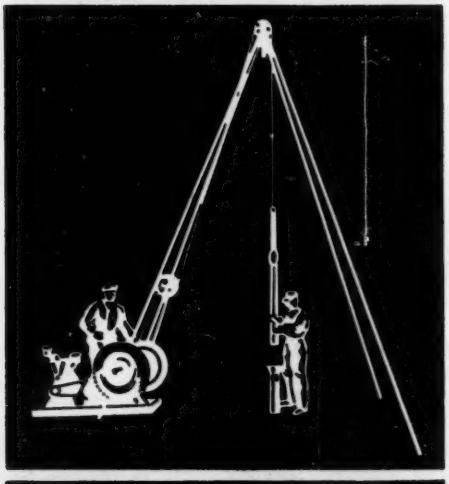
In this rather Alice-in-Wonderland atmosphere, the mining industry presses on with its projects as best it can.

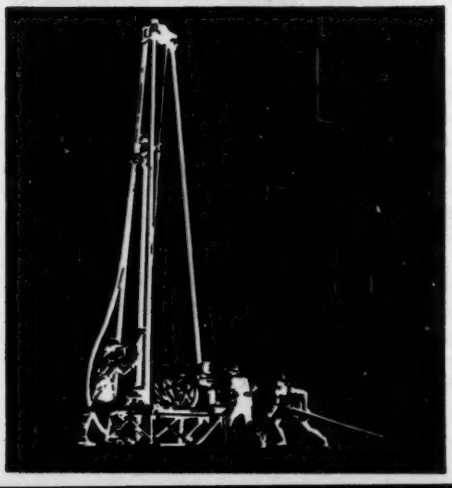
A project for the construction of a copper refinery at Chanaral to process El Salvador blister output plus another 20,000 tonnes from other sources has been made known to Dr. Enrique Serrano, the Mining Minister, by Anaconda's subsidiary, Andes Copper. It is estimated that the plant will cost $15,000,000-$18,000,000 and will take about two years to build. El Salvador's capacity is rated at about 108,000 tonnes of copper a year, with output currently running at an annual rate of about 96,000 tonnes. In addition, Chile Exploration, another Anaconda subsidiary, proposes to invest $9,000,000 to increase output of the Chuquicamata mines by 10 per cent.

Braden has announced the start of a $6,000,000 project to increase the productive capacity of its mine, mill and smelter facilities near Rancagua, 65 miles S.E. of Santiago. Crushing, concentrating, smelting and refining capacities are to be increased to achieve an annual output of 191,000 tonnes of copper. Kaiser Engineers' International will









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handle this programme, which is to be completed by December 31, 1961.

The Chilean government has authorized the Cerro xploration Co. to establish agencies and operate in hilean territory. The company will operate in Chile under e same name and its principal agency will be in Santiago. s main objectives will be to "develop, negotiate and rry out all kinds of operations related with mining tivities and industry".

Workers at the Potrerillos and El Salvador mines have jected Anaconda's offer of a 7 per cent general increase wages plus fringe benefits, but the latest announcement ates that the company and the Union representatives have greed to restart direct negotiations.

ROMISING FIJI GOLD SURVEY

Investigation of the Waimanu gold deposits was undoubtedly the most promising item in the Fiji Geological Department's programme for 1960. Acting on old reports of alluvial gold in the Waimanu River the Geological Survey investigated the area last year in co-operation with the Mines Section of the Lands Department. Using geophysical techniques, the expedition have established the possibility of 3,500,000 cu. yds. of gold bearing gravel, and additional orebodies are suspected at a base metal prospect near Suva.

The report of the Mines Section indicated the size of these deposits of gravel in which values of 5 to 12 grains per cu. yd. were noted. If the preliminary findings of the expedition are subsequently borne out the Waimanu gold deposits will be a most significant contribution to the economy of the colony.

A preliminary expedition last year reported only scattered colours as a result of panning in the river, but a more detailed examination conducted this year followed the aerial reconnaissance that had revealed extensive flats. It had already been estimated that the area contained 100,000 cu. yds. of low-grade ore.

A third expedition was carried out in co-operation with the Lands Department but this attempt was unsuccessful because of heavy rains. Nevertheless one pit was sunk in flats adjacent to the original flats and returned as much as 20 grains per cu. yd. The size of the deposit will be doubled if the second set of flats can be proved.

At the same time it was found that one mine and numerous prospects were probably uneconomic and owners were advised to abandon them.

FRENCH MINING CODE EXTENDED TO ALGERIA

Regulations covering the prospecting and mining of minerals in Algeria have been brought into line with those ruling in Metropolitan France says the latest issue of *Mineral Trade Notes* published by the U.S. Bureau of Mines. The French mining code classifies mineral deposits according to the type of mining generally used to extract them. The three-fold division is as follows : Mines, Surface Mines, and Quarries. Most of the provisions of the code apply only to mines. The first category of mines lists about 41 minerals, others may be added by official decree. The second category, surface mines, includes peat-beds and iron ore mines which can be exploited without the construction of shafts, passageways and permanent works. The third, quarries, covers other deposits useful to the economy such as materials used in construction, bridge and road building, materials for the ceramics industry. All materials in the second and third categories may be mined in surface or subterranean mines, but they are subjected to less stringent regulations than for minerals classified under mines : no exploration or exploitation permits are required from the government and the right to explore and exploit such deposits belongs in general to the owner of the property. Regarding surface mines for iron ore, however, a declaration must be made to the local Prefect before operations are begun.

The right to prospect for mineral deposits classified under mines is granted to the owner of a property or anyone possessing his consent after declaration to a Prefect, or in the absence of such consent to anyone having the authorization of the Delegate General in Algeria, or anyone possessing an exclusive prospecting permit.

Applicants for exclusive prospecting permits must have sufficient technical and financial capacities to carry out prospecting. Furthermore, at the time of making an application the following information must be presented : a general work programme adapted to the time limit requested, the extent of the area to be prospected and the geographical and geological character of the territory. In addition, the applicant must agree to devote a certain minimum financial effort to the prospecting planned.

Minerals classified under the heading Mines can only be extracted if one of two types of permits has been obtained; that is an exploitation permit or a concession. The former is granted by an *arrêté* of the Minister in charge of mines and the Minister in charge of Algeria after a public enquiry and reference to the General Council of Mines. If minerals used in atomic energy are involved there must also be reference to the Atomic Energy Commision. Concessions are granted by official government decree with no time limit except for petroleum and natural gas which is limited to a maximum period of 50 years.

Holders of concessions and exploitation permits must pay a fixed annual royalty based on the area of the holding and the type of mineral being exploited, with provisions for total or partial exemption under certain conditions.

A concession may be cancelled when it is jointly owned by two or three persons and not exploited for a period of ten years; secondly, when mining royalties are not paid for a period of two consecutive years; thirdly, when changes of proprietorship or subleasing of concession and rights are not reported and authorized subsequently by government decree within a year of the effective date.

Finally, the code requires that any person making an excavation greater than 10 m. deep must explain the purpose in a declaration to the government's chief mining engineer.

GAMMA IRRADIATION IN MINERAL RESEARCH

Plans for building an atomic-research facility at Albany, Oregon, for studying minerals and mineral fuels have been announced by the Bureau of Mines, U.S. Department of the Interior. The new structure, scheduled for completion in the next 12 months at the Bureau's Metallurgy Research Centre, will house 100,000 curies of cobalt-60, to be supplied by the Atomic Energy Commission. This radioactive isotope will be used in fundamental research to determine the effects of gamma radiation on the physical and chemical properties of coal, petroleum, and many metallic and nonmetallic minerals.

Scientists believe that gamma irradiation may help to advance mineral technology, either by altering the properties of minerals and fuels so they can be processed more easily or by speeding chemical reactions in mineral-treating processes. Small-scale studies by the Bureau of Mines already have indicated that both approaches are promising.

Close-up of the mining area, the screening unit in the pit and belt conveyor to stacker unit

IRON ORE PRODUCTI H

COMPRISING an extension of the famous Hall-Rust-Mahoning opencast iron ore mine in the Mesabi, Minn., U.S., the Pierce mine belonging to the Hanna Ore Mining Co., M. A. Hanna Co., Agents, of Cleveland, Ohio, has gradually been brought into production as construction work there has progressed. Having reserves of about 10,000,000 tons of iron ore and an estimated life of about 15 years, the Pierce mine includes the Nordac, Impro B and Roy properties which partially extend into the old and now evacuated township of Hibbing. The pit itself will cover an area of 125 acres.

Rather more than 40 years ago, the mining companies in the area began arrangements to develop the ore fields in North Hibbing and these included plans to relocate part of the town. As the orebody was developed more and more of the community was moved. Some of the structures were also moved while others were razed to the ground and replaced by new buildings.

Stripping the Overburden

Stripping of overburden at the Pierce mine began on August 14, 1957, and will involve the removal of 10,000,000 cu. yd. of surface dirt and about 15,000,000 cu. yd. of rock and lean ore. The average depth of the overburden is 100 ft. Beneath the overburden the orebody is found in almost horizontal layers very suited to strip mining. Some parts of the formation consist of thinly bedded slaty taconite but other sections are made up of thick-bedded cherty taconite. Composition varies considerably and some of the ore can be straight washed while other crude has to undergo heavy media treatment. The average composition, however, works out at:—iron 25.71 per cent; silica 58.70 per cent; aluminium oxide 0.54 per cent; phosphorus 1.96 per cent; other chemicals 13.09 per cent.

The heavy equipment used for stripping at the Pierce mine, including the giant 30 cu. yd. Bucyrus-Erie 1150-B dragline, mobile hopper, 540 ton portable screening plant, conveying system and stacker, was moved from the company's Morton mine, four miles away, during March, 1957. This four-mile journey took 18 days to complete because the moving had to be done when power lines could be cut with the least amount of service interruption. Only 71 hours were spent on the actual move to the Pierce mine. To move the dragline, which is electrically powered, its 3,000 kVA. transformer was mounted on a trailer and connected up to the 23,000 V lines along the route.

Used for removing the overburden loose dirt and rock, the dragline has a maximum digging capacity of about 1,500 cu. yds. per hr., a maximum digging depth of 110 ft. and a maximum dumping height of 60 ft. It dumps the material into the portable screening plant which separates the large rock from the dirt and passes the latter on to a conveyor belt for transportation to a spoil area three miles away. Having a working weight of 2,420,000 lb. and using 275,000 lb. of ballast, the dragline exerts a ground pressure through its 44 ft. base of 11 lb. p.s.i., while its 8 ft. x 48 ft. walking shoes exert a pressure of 21.9 lb. p.s.i. The overall width of the outside shoes is 63 ft., length of step 7 ft. 6 in. and walking speed 0.11 m.p.h.

The dragline bucket has an inside measurement of 9 ft. 4 in. wide x 7 ft. deep x 13 ft. 6 in. long and, weighing 51,000 lb., operates with a 450 ft. x 2 in. dia. hoist rope and a 290 ft. x 2½ in. dia. drag rope from a 180 ft. boom. The voltage input is 4,000 V.—60 cycle, hoist pull (stalling cond.) 232,000 lb., hoist speed (loaded) 350 ft. per min., drag pull (stalling cond.) 260,000 lb., and a drag speed (at 75 per cent of stall) 250 ft. per min.

Moving on eight Caterpillar tracks, each 36 in. x 13 ft. 6 in., which exert an average empty group pressure of 23.43 lb. p.s.i., the 1,093,065 lb. mobile hopper and screening unit can travel at 0.2 m.p.h. It has a 7 ft. x 18 ft. apron type feeder and a 7 ft. x 12 ft. screen with tapered openings 9 in. in maximum size. The overall height of the unit is 48 ft. and the size of the hopper opening is 30 ft. x 28 ft.

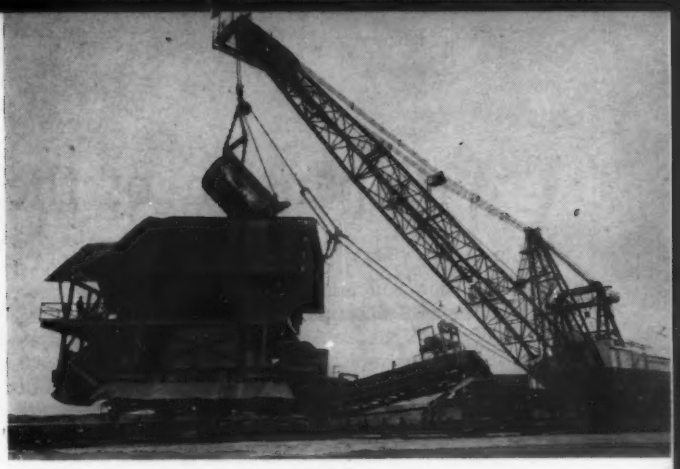
Although most of the overburden is being stripped by dragline, for rock removal and cleaning-up operations at the formation and at the surface, involving about 1,500,000 cu. yds. of material, 3 cu. yd. and 8 cu. yd. capacity Bucyrus-Erie shovels and 20 cu. yd. rear dump trucks are being used. Shovels and trucks were also used for removing the surface layer under the old townsite of Hibbing, the foundations from the old buildings, sewer and water pipelines, tram tracks, paving and other materials being cleared away by digging a shallow cut.

Transporting the Spoil

From the screening plant to the spoil area the belt conveyor system changes direction at ten transfer points and travels up hills and down valleys. It also crosses highway 169 and at one point is routed through a culvert. The belt width is 48 in. and belt speed 550 ft. per min. Its capacity it about 1,500 cu. yds. per hour, with a maximum of 1,800 cu. yds. and it provides a total net lift of 100 ft. It is the longest belt conveyor on the Mesabi Range and also the longest belt line operated by the M. A. Hanna Co.

On arrival at the dump, the spoil is transferred to a stacker and trailing truss. Swinging in both directions to give an even distribution on the dump, the 245 ft. long stacker with 75 ft. cantilever has a 48 in. wide belt which

...HANNA'S PIERCE MINE



The dragline and mobile screening unit used for stripping at the Pierce opencast mine

...ns at a speed of 625 ft. per min. It operates on Caterpillar treads which convey a 12 lb. p.s.i. load to the ground. The initial length of the trailing truss was 420 ft. The total weight of the stacker and trailing conveyor with the truss loaded is 420, 800 lb. and the live load 88,000 lb. As stripping progresses the belt conveyor is shortened at the pit end and lengthened at the stacker end.

During the winter of 1957/58 the dragline-conveyor system was operated until December as an experiment to determine how effectively and efficiently the machinery could operate under freezing weather conditions and a good deal was learnt about cold-weather operation during this period.

During 1958/59 a tailings basin, measuring ¼ x ¼ mile, was constructed at the Pierce mine. More than 1,200,000 cu. yds. of material, borrowed from within the pond area, were needed to build the surrounding dyke. At the basin, two 6,000 g.p.m. vertical turbine pumps, housed in a steel structure, were installed to return the clear water through a 30 in. pipe to the plant. To conserve the water supply, this re-cycled water is constantly re-used in the beneficiation plant.

Mining Equipment

Mining at Pierce is carried out by the conventional shovel-truck method. A Bucyrus-Erie 40-R electrically powered drill, with a "down-the-hole" bit, is used for blast-hole drilling. Normally, these holes are 7½ in. in dia. and 33 ft. deep and are spaced on an 18 ft. x 18 ft. pattern, but hole dimensions, spacing and the explosive used depends on the type of material being worked. The average rate of drilling is 250 ft. per shift. When more profitable the 40-R machine is used for rotary drilling 9 in. holes.

Most of the holes are dry and these are blasted with ammonium nitrate and fuel oil. For the wet holes, 250 lb. of Dynatex B-WR nitro carbo nitrate in 6½ in. 30 lb. cartridges are used. Primacord detonating fuse and millisecond delay connectors are also used. Blasting is done once a day and usually takes in eight to ten holes according to location. Such a blast yields about 400 cu. yds. of material per hole, representing a powder factor of 0.62 lb. of explosive per one cu. yd. of material.

To remove the iron ore, one electrically-powered 8 cu. yd. P & H and two 8 cu. yd. 190-B Bucyrus-Erie shovels are provided. Other available machinery includes one 71-B 3 cu. yd. Bucyrus-Erie shovel and one 35 ton P & H crane.

Euclid and Mack trucks of 34-ton and 40-ton capacity deliver the crude ore to the screening plant installed at the pit. A 60-ton diesel-electric truck built by Unit Rig and Equipment Co. to Hanna's specification is also being tried out at the Pierce mine.

The first car load of ore at the mine was loaded on April 14, 1960, and up to this time nearly 6,500,000 cu. yds. of surface and rock had been removed. The ore varies from high-grade direct-shipping types to low-grade ores that need full treatment at the concentrator.

At the crushing and screening plant, which has a capacity of 1,250 tons per hour, a 42 in. x 48 in. Pioneer primary jaw crusher, together with a 5 ft. x 16 ft. apron feeder, have been installed. Oversize ore can either be crushed or rejected, the latter being hauled to the dump. Reduced to −5½ in. size, the screened product is delivered, by way of a 48 in. conveyor belt, out of the pit to a radial stacker unit which directs it either to the plant itself, to surge piles or to a loading pocket. How the ore is separated and stacked is determined by chemical analyses.

The ore requiring treatment is dumped into two 20,000 ton surge piles with underground reclamation handling equipment delivering to the concentration plant. Here, water is added to the ore which passes first over a primary screen and then to a scrubber, the oversize material being recycled after passing through gyratory crushers.

Beneficiation Facilities

The beneficiation facilities at the Pierce mine have been engineered so that the crude ore can be straight washed, using spirals for the fines, or processed through heavy-density equipment. Since there are separate surge piles to feed the heavy-media and cyclone section, these can be operated independently and, in this way, maintenance work on a section can be carried out while the remainder of the plant is working.

Capable of dealing with 800 tons of crude ore per hour, the new Pierce mill is all-electrically operated and incorporates a number of automation and electronic features which are still in the process of being brought to a perfection state of efficiency.

More than 200 people will be needed to operate the Pierce mine and some have been transferred from other Hanna units, others have been taken on as new employees. Mining is carried out on the basis of two or three eight-hour shifts as required, while the concentration plant operates 24 hours a day. Normally, the mine will operate for rather more than six months, while stripping will continue during the winter.

All the ore from the Pierce mine is sent by rail to Superior, Wisconsin, whence it is shipped by Lake Superior ore-boats to the steelmakers.

Expansion of the Dead Sea Works

(From our own Correspondent)

THE Sodom enterprises of Dead Sea Works Ltd. have completed all necessary preparations for the floating of a stock issue totalling IL. 27,000,000. The purpose of this share issue, which will supplement a $25,000,000 World Bank loan and $10,000,000 aid from an American financial institution, together with IL. 38,000,000 of the company's own depreciation funds, is to provide the plant with the capital for an ambitious and far-reaching expansion of its operations. It is expected that the whole investment will ultimately reach IL. 128,000,000 (approximately £25,600,000 sterling).

This programme has been carefully investigated by the world-famous firm of Arthur D. Little Inc. of U.S.A. who have submitted an optimistic report. The consultants were mainly occupied with the question of marketing prospects for the additional potash output. Their conclusions are reassuring in view of the fact that world potash consumption is steadily expanding. By the time the Dead Sea Works will be able to ship additional quantities on a large scale, a ready market should be available over a wide area from the Eastern Mediterranean to India and Japan, where the company will have a freight advantage over other producers. Equally favourable will be the marketing outlook for the ancillary products such as bromine compounds, magnesite, and even a certain quantity of table salt included in the envisaged development scheme.

As part of the programme it is planned to raise potash output from the current 140,000 tonnes annually to almost 600,000 tonnes at the completion of the first stage, and later to the target of about 900,000 tonnes a year. Other projects include the building of a new potash refinery and a power station, expansion of the annual capacity of the bromine factory to 10,000 tonnes, construction of a bromide plant at Beersheba, and a factory for the production of magnesite chamotte tiles.

As a result of these forthcoming developments it will become worthwhile to push the railway terminal from Beersheba to a point much closer to Sodom, thus reducing the use of road transport to a minimum. Doubtless the programme will also lead to improvements in the highway to Eilat on the southern tip of the Negev, cutting the distance of the haul from some 300 k. to about 240 only. The construction of deep-sea harbours with modern storage and loading facilities at Ashdod on the Mediterranean and perhaps also at Eilat, the Gateway of the Red Sea, will obviate the need to move potash shipments by way of distant Haifa Port. Production costs will also be reduced through the construction of a special power station adapted to the requirements of potash and bromine plants and through the use of nearby Zohar-Kidod natural gas replacing liquid fuel. Experts predict that—when expansion is completed—Dead Sea Works will be in a position to base their calculations on the costs of leading Canadian and American potash producers; i.e. $22.70 and $25.60 respectively.

The company's Annual Report, just issued, provides the following details of the development programme.

The directors expect that potash production will reach about 190,000 tonnes per annum within the next two years. A limitation, however, on the expansion of production beyond this quantity is the restricted area of land in the vicinity of Sodom suitable for evaporation pans. Under the expansion scheme, capacity is to be increased to about 590,000 tonnes annually by the extension of the existing plant installations and pumping stations, by the construction of a total of about 60 k. of dykes, by the enclosure of some 100 sq. k. of the Dead Sea to form concentrating pans, by the construction of additional processing plant for the annual production of about 400,000 tonnes of potash from carnallite produced in the pan system, and by necessary modifications to the present concentrating and crystallising pans. Design and construction of the dykes and the processing plant will finally permit the addition of facilities required for the increase of annual output to about 900,000 tonnes.

Facilities to be installed for the increase of the annual capacity of Dead Sea Bromine Company from about 2,900 to 10,000 tonnes, of which rather more than half is converted into ethylene dibromide, are expected to be completed by January 1962. An additional plant will be set up in Beersheba by Bromine Compounds Ltd. with a capacity equal to a bromine content of about 2,000 tonnes annually and will be ready by about April next year.

It is claimed that the Dead Sea bromine plant is already the largest exporter of bromine and bromine products in the world.

The annual report goes on to mention the plan for the setting up by the Magnesite Company of a factory for the production of about 75,000 tonnes of calcined magnesia per year. The plant will be ready by the end of 1963. Furthermore, a plant will be constructed for the annual production of 20,000 tonnes of table salt from end-brine and waste salt from the potash production unit, scheduled for operation by April 1963.

It is the intention of the company to enlarge output capacity of the enterprise, at a later stage, by an additional 200,000 to 300,000 tonnes of potash per year, which — based on current prices and rates of exchange — would require approx. another IL. 24-27,000,000 Israel currency, without taking into account interest charges.

The Annual Report gives the following data about the production of potash, salt and bromine during the last five financial years :

	Potash	Salt	Bromine
1956/1957	41,000 tonnes	5,973 tonnes	—
1957/1958	89,000 „	9,369 „	917 tonnes
1958/1959	105,000 „	18,689 „	1,584 „
1959/1960	115,000 „	13,485 „	1,885 „
1960/1961	135,000 „	13,963 „	2,870 „

Under a new concession, which the company obtained from the State of Israel for the period 31 May 1961 to 31 March 1999 (Dead Sea Concession Law 1961), Dead Sea Works is under obligation to operate the undertaking and to increase its capacity by 400,000 tonnes of potash per year and to use its best endeavours to increase it further at a later stage by an additional 200,000 to 300,000 tonnes per annum. The company has undertaken to pay the government as from 1 April 1964 a royalty of not more than 5 per cent on the ex-works sale price of its products and as from the eleventh year of the concession a fair rental on the lands leased and to be leased to it. On termination of the concession, the fixed tangible assets of the firm in Sodom and the Dead Sea area will become vested in the government, and in consideration therefore the government will pay to the company the depreciated replacement value; i.e. an amount equal to the price of acquiring similar assets while new at the then existing market price, less depreciation in respect of the period of use of each such asset. All other assets will remain vested in the company.

The Dead Sea Works enterprises at present employ about 550 people of whom 150 are highly skilled scientific and administrative personnel. After the proposed expansion programme's completion, the staff will be increased to about 1,000 persons.

Mineral Resources Development in the U.S.S.R.-I

The progress and problems of Russia's mining industry are discussed by Lt. Col. Jan Kowalewski in "The Mining Journal Annual Review", 1961. In a supplementary article, of which this is the first of two instalments, the position in regard to individual metals and minerals is surveyed.

In 1960, 157,000,000 tonnes of crude iron ore were mined (48 per cent from open cast mines), from which 107,000,000 tonnes of marketable ore were obtained. Pig iron production reached 46,800,000 tonnes, and that of steel 65,300,000 tonnes. The targets for 1965 are respectively 51,200,000 and 71,300,000 tonnes, with a "third heavy industrial centre" to be built in Siberia.

Soviet iron ore reserves are 11 times as big as those of the United States and account for 40 per cent of total world resources. Of the individual republics comprising the U.S.S.R., the richest in iron ore is Ukraine (31 per cent), followed by Central Russia (21 per cent), Kazakhstan (18 per cent) and Ural (15 per cent). The Ural iron ore reserves are becoming exhausted, however, the Magnitnaya Gora deposits having been exploited to the extent of more than 50 per cent, while the Blagodatnaya Gora mines will soon be closing down. Nevertheless the Ural metal industries will be provided with a sufficient quantity of iron ore from the large new opencast mines at Kachkanar and at Sokolovo-Sarbaysk (Kustanay region). The latter are five times as large as the Magnitnaya Gora deposits and contain mainly 45-50 per cent iron ore, needing only agglomeration. Three ore processing plants are now in construction there which by 1965 will produce 24,000,000 tonnes of processed iron ore per year, the initial rate of production being 11,000,000 tonnes.

The general trend of development of the Soviet iron ore industry is to exploit mainly large deposits with ores which are relatively poor but can be easily processed by simple and cheap methods. Of the surveyed iron ore deposits, amounting in 1959 to 85,500,000,000 tons, 38,300,000,000 tonnes are of commercial value. Of the latter, 16,700,000,000 tonnes are located in the East.

The "geological" reserves are estimated at 147,000,000,000 tonnes, of which 132,000,000,000 are in the East, and consist mainly of ore difficult to process (107,000,000,000 tonnes), only 27,500,000,000 tonnes being easily processed (14,500,000,000 tonnes in the east and 13,000,000,000 tonnes in the west).

In general the prospected reserves of rich and easily processed ore (28,000,000,000 tonnes) guarantee the planned development of the Soviet iron and steel industry for at least 15-20 years. But in view of the small percentage of rich ores, geologists must find more high-grade deposits in order to satisfy the needs of the new Karaganda, West Siberia, and Tayshet iron and steel works now in construction. The total increase of iron ore reserves during 1959-1965 must be of the order of 6,300,000,000,000 tonnes with an average content of 45 per cent iron, which must include 3,000,000,000 tonnes with an iron content exceeding 55 per cent (of which 1,650,000,000 tonnes must be situated in Western and Eastern Siberia).

The general aim is to create an ore-coal basis for the iron and steel industry such that a yearly production of 150,000,000 tonnes of pig iron could be assured, of which 50,000,000 tonnes would be obtained from high-grade ore and 100,000,000 tonnes from processed ore. The greater part of the pig iron output would then be produced in the East.

Add

Coal

In Soviet fuel consumption, coal still plays a leading role accounting for 69.5 per cent in 1960, and even in 1965 it will still comprise 57.2 per cent of the total consumption. Although the "geological" reserves of coal in the U.S.S.R. are the biggest in the world, amounting to 8,669,000,000,000 tonnes, only 1,015,000,000,000 tonnes are considered as "active", i.e., suitable for practical exploitation. Of these only 464,800,000,000 tonnes had been prospected by 1959, their composition being: 179,000,000,000 tonnes of A, B and C/1 categories and the remaining 285,800,000,000 tonnes of C/2 quality. Moreover, of these prospected reserves only 97,400,000,000 tonnes are situated in the Western provinces of the U.S.S.R., the remaining 367,400,000,000 tonnes being in the East.

The geological reserves have been estimated down to 1,800 m. A break-down by depth shows 47.3 per cent down to 600 m., 32.7 per cent between 600 and 1,200 m.; and 20 per cent over 1,200 deep. Of the total reserves 63 per cent consist of bituminous coals and 37 per cent of brown coals.

In 1960, 513,000,000 tonnes of coal were mined, including 110,000,000 tonnes of coking coal which satisfied the country's requirements for metallurgical coke; about 30 per cent of Soviet coal production consists of brown coal (lignite) and about 10 per cent of anthracite.

The 1960 coal output was only one per cent higher than that of 1959, which in turn was two per cent above that of 1958. This "deceleration" of Soviet coal production becomes more significant, if we take into consideration the fact that in 1960, in Donbas alone, 457,000 tonnes of lowest grade coal and anthracite had to be dumped as unusable, although this quantity was included in the production statistics. (*Economic Gazette, Moscow*, 18.2.61.) This was the result of sacrificing quality to quantity. The labour productivity in the Soviet coal mining industry is still three to five ("or more") times lower than the U.S. average. Several small pits in the Moscow area and in the Urals are to be closed, as uneconomic and producing low quality coal. There is enough coal in the Western and Siberian industrial areas, but there is an urgent need for a new coal basin in the Volga-Ural region, where intensive prospecting for coal revealed substantial seams at too great a depth to be mined. Of the prospected reserves, 69,000,000,000 tonnes are suitable for open cast mining, and in the future up to 600,000,000 tonnes could be produced by this method, mainly in the East, where, by 1965, 40 per cent will be obtained from opencast mines.

By Jan Kowalewski

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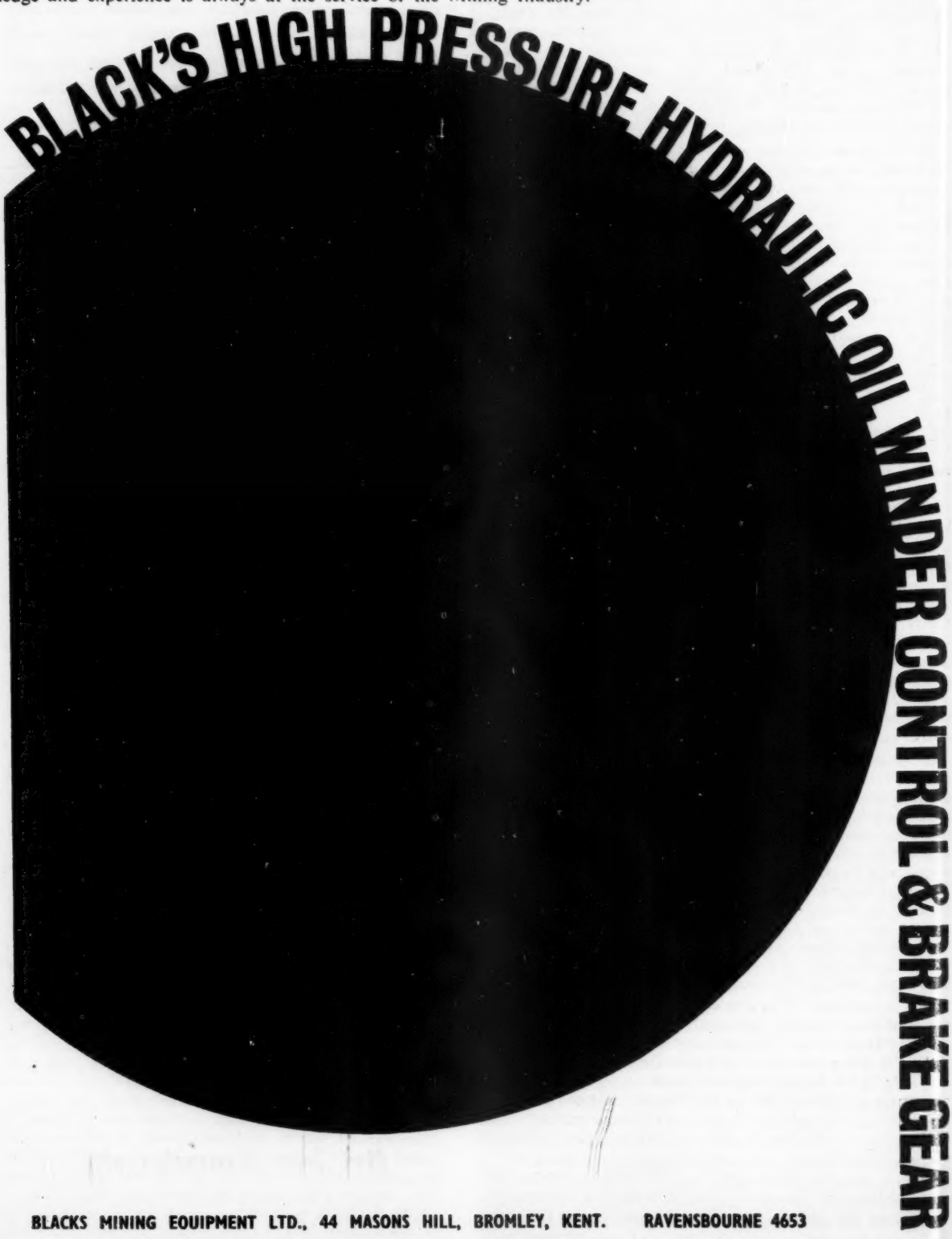

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Manganese

The U.S.S.R. possesses the largest manganese ore reserves in the world, amounting to some 80 per cent of the world total, and is responsible for nearly half the total ore production. Over 90 per cent of the Soviet manganese reserves are concentrated in the Nikopol and Chiatura deposits. Eastern regions have only nine per cent, these being situated in the Urals, Kazakhstan, Western Siberia and the Khingan Mountains.

All manganese ores in Nikopol and Chiatura are processed, but Soviet commentators have criticised the methods used, which result in heavy losses of metal.

At the beginning of February 1961 new mines and ore processing plant were commissioned at Chiatura, these being known as the Darkveti manganese combine. The plant, a very modern one, will process low-grade ores (22-25 per cent Mn), producing a concentrate containing 50 per cent Mn. Up to now, all other processing plants in Nikopol and Chiatura have been processing much richer ores, to produce the same 50 per cent concentrate.

In the East, and especially in Siberia, no conveniently situated manganese ore deposits have as yet been discovered. There are no geological possibilities of finding any rich manganese ores in Siberia, and therefore the third Soviet ferrous metallurgy centre in Siberia will have to be supplied with manganese ore from Chiatura and Nikopol, which involves thousands of kilometres of railway transport along the most crowded railway line in the world.

Very large deposits of manganese carbonate ore have come to light in Buryato-Mongolya (the Ikat-Garginskoye deposits), but technologists have yet to find a satisfactory method of treating these ores. Siberian scientific institutes are now working on processes which would enable manganese ores of the Usinskyi deposit type (20 per cent Mn) to be used.

The U.S.S.R. exports large quantities of manganese concentrates to the West, shipments to Britain alone amounting to over 100,000 tonnes.

The Seven Year Plan provides for manganese ore production to be increased to a level 2 to 2½ times that of 1958 by 1965.

Chromium

Since the discovery in 1937 of two of the biggest chromite deposits in the world at South Kimpersay (near Akhtyubinsk in Kazakhstan), and in the Urals (Saranovsk and Verbluzhya Gora), the Soviet Union has been self-sufficient in chromium and has had an increasing surplus available for export to the Free World.

Unfortunately, as in the case of manganese, no chromite deposits have as yet been discovered in the East (Siberia), where the rapidly growing "third metallurgical basis" will need large quantities of this commodity.

Soviet geologists are continuing to search for chromite in Siberia and Kazakhstan, both for this reason and with a view to increasing the nation's chromium reserves of metal and in order that future needs of domestic industry and exports may be secured.

Titanium

Theoretically the Soviet Union occupies one of the leading places in the world as regards titanium ore reserves. However, the main known deposits consist of titaniferous magnetite, and perovskite titanomagnetite (ores of the Kola peninsula and Northern Ural), for which a technique for the extraction of titanium metal at reasonable cost has not yet been found. The presently known reserves of such industrially interesting titanium minerals as alluvial deposits of ilmenite-magnetite and complex rutile-ilmenite-zirconium ores are concentrated in Ukraine. Very promising alluvial deposits of zircon rutile-ilmenite have been found at Samotkansk. These contain very rich pockets which have a titanium content 3-4 times higher than the average for the whole deposit. Moreover at least one-third of the titanium content is in rutile.

Geological prospecting for titanium ores is being extensively undertaken and it is hoped to find industrially interesting deposits in Krasnoyarsk Kray, in Kazakhstan and in Buryato-Mongolia. The most important problem, however, is considered to be the development of an economically sound technological process which would enable exploitation of titanium ores of the perovskite and similar types, of which large deposits have already been delineated.

Cobalt

Until recently the Soviet's cobalt production was confined to the nickel-cobalt smelters in the Kola peninsula, Norilsk and the Urals, based on compound sulphur ores containing nickel, copper, cobalt, platinum, selenium, etc. The known reserves of cobaltiferous ores are sufficient to cover Soviet needs in this metal. Every year the Soviet Union exports moderate quantities of cobalt, at the same time importing equivalent quantities from Poland.

The Tuva cobalt combine was commissioned during 1960 and produces cobalt from local arsenic-cobalt ores.

Tungsten and Molybdenum

The Soviet Union is regularly importing large quantities of tungsten and molybdenum concentrates from China, as well as tin, quicksilver and other metals. The trade agreement between the U.S.S.R. and China, signed in March 1960, provides for a "considerable increase" in all these imports.

Soviet tungsten production was not developed until after World War II, although geological prospecting for tungsten ores began as long ago as 1930. Today, Soviet geologists maintain that the U.S.S.R.'s tungsten reserves are among the largest in the world. There are a large number of scheelite and wolframite deposits in Kazakhstan, in Central Asia (4 large, 11 medium and 9 small mines in the mountains), in Buryato Mongolia, Transbaykalia, Far North East (Chukotka) and North Caucasus (Tyrny Auz). Now, however, the U.S.S.R. is able to cover domestic needs and it is noteworthy that in 1960 the tungsten production increased by 47 per cent over that of 1954.

At present the Soviet's known reserves of molybdenum ores and her production of molybdenum metal, ferro-molybdenum and molybdenum salts are sufficient to cover domestic needs in these commodities and to satisfy the future increase of consumption for many years to come. Of major importance are the copper — molybdenum — tungsten ores, from which molybdenum is extracted as by-product. The main task of Soviet geologists at present is to discover molybdenum deposits in economically developed regions with good communications. There are seven main molybdenum combines (mines and processing plants), these being situated at Tyrny Auz (N. Caucasus); Kadzharan (S. Armenia); Dzhida (Buryat Mongolia); Balkhash (Kazakhstan); Umalta (Khingan Mountains) Sorsk (Khakassia); and the Almalyk (Uzbekistan) Copper Molybdenum Combine (commissioned in 1960).

Two more copper molybdenum combines are now in construction in Soviet Armenia. The bigger one at Agarak,

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near Kadzharan, in Southern Armenia, will be commissioned this year. The smaller one is at Alagez, northwest from Erevan.

In 1960, Soviet production of molybdenum was twice as big as in 1954, and the known ore reserves have been increased by about 70 per cent over those known in 1955.

Antimony and Quicksilver

In 1960 the main producing region for antimony and quicksilver was Kirghizia and it will remain so during the rest of the Seven Year Plan.

The present known antimony reserves are sufficient to maintain production for many years at a level commensurate with the increasing needs of the U.S.S.R. Moreover imports from China help considerably. New deposits of antimonite have been discovered in Transcaucasia (Sageb region).

At the Yuzhnyi antimony combine in Kadamdzhar (Kirghizya), a new method of extracting antimony from slags has been tried out successfully on a commercial scale. Slag from dumps and non processed ore have both been treated by this method which is based on fluidised roasting. Extraction of metal from ore has been improved by 20-25 per cent. The first trioxide of antimony has been obtained.

Quicksilver is produced in Kirgizia (Khaydarkan) and in Ukraine (Nikitovka). Recent discoveries are in Transcarpathia (Vyshkov), and in Kamchatka where a large quicksilver belt has been found along the eastern slopes of the main mountain range. Thanks to these and other discoveries, the known quicksilver reserves in the U.S.S.R. have been increased by 80 per cent in 1960, as compared with 1955, and will meet the requirements of Soviet industry. The first Soviet exports to reach London for forty years arrived last December and were followed by further shipments.

Nevertheless geologists are being pressed to discover more quicksilver deposits, and smelters are being strongly reproached for considerable losses of quicksilver during extraction, amounting on average to 10 tonnes per year per plant.

Copper

Soviet commentators claim that, taking into account all deposits of copper ore discovered up to 1961, the Soviet Union has the largest known copper reserves in the world. Nevertheless, even in 1960, copper continued to be regarded as a "deficient metal", and a nation wide economy campaign to save it remained in force in the Soviet Union and in all satellite countries. About 20,000 tonnes of electrolytic copper were imported by the U.S.S.R. in 1960. The total copper output has been estimated at between 550,000 and 600,000 tonnes (of which about 30 per cent consists of secondary metal). Large new copper ore deposits at Altyn Topkan (Central Asia), Gay (near Orenburg) and Udokan (N.E. of Chita), were actively prepared for mining during 1960 and are expected to produce enough copper concentrate to ensure capacity operation of all existing Soviet copper smelters, as well as of two new ones — the large Dzhezkazgan and Almalyk plants, now in construction.

The main new opencast working at Gay is 1,500 m. across and 50 m. deep. On February 10, 1961, the underground mine came into operation. Up to now 5,000 tonnes of copper have been smelted from Gay ore.

Capital investments are being distributed as to 59 per cent for the enlargement and reconstruction of the existing copper enterprises, 28 per cent for the completion of those actually in construction, and only 13 per cent for new ones.

Technical improvements should reduce the losses of metal, which in 1960 reached 21 per cent of metal contained in the mined ore.

During 1960 50 per cent of the total copper output came from Kazakhstan alone. By 1965, 88 per cent of refined copper will be produced in the East.

Zinc and Lead

During 1960 great stress was laid on geological prospecting for new polymetallic ore deposits, and large quantities of lead and zinc ore concentrates were imported from China, Korea, Persia, Poland and Bulgaria.

Large and rich lead-zinc ore deposits have been discovered in the bed of the Angara river, near her confluence with the Yenissay, and the building of a dam, which would have flooded these deposits, has been suspended. A new opencast mine is in construction at Zyryanovsk and the big polymetallic mines at Leninogorsk and Ust Kamenogorsk, are being reconstructed. In 1960 the lead and zinc output reached the planned level, estimated at 450,000 tonnes of zinc and 320,000 tonnes of lead, but the increase of ore reserves did not reach the desired levels, which envisaged an increase of 42-50 per cent in surveyed deposits as compared with 1956.

Near the Belousovskyi deposit of polymetallic ore, which is now exhausted, a new rich deposit has been found.

Nickel

The construction of the very large nickel combine at Buruktal (150 km. east of Orsk in South Ural), which consists of mines, ore processing plants, and a workers' town known as Svetlyi, progressed satisfactorily during 1960.

To satisfy the rapidly increasing needs for nickel and cobalt, all nickel mines, ore processing plants and smelters have undergone considerable extensions. The 1960 production has been estimated at 80,000 tonnes of nickel, more than 80 per cent of the ore being mined by opencast methods; the average nickel content was 0.65 per cent.

Geological prospecting continued during 1960 for new nickel deposits, and surveying of the large nickel ore deposits in North Ural, near Severouralsk made further progress.

Tin

Soviet tin ore deposits (mainly cassiterite-sulphide ores) are sufficiently large to provide for a considerable increase of tin output, but they are mainly located in cold and far-distant regions. This is why several rich tin deposits surveyed in 1950 in the Yana river basin have not been exploited apart from the Ege-Khaya and Deputatskyi mines. At the beginning of 1960 the Yultin tin combine (Chukotka) was commissioned and an all-year-round road has been built to Egvekinot in Kresta Bay. The construction of a large tin combine at Solnechnoye (in Miao Chan mountains near Komsomolsk on Amur) has been progressing rapidly, and a road to Komsomolsk had been opened by the end of 1960. This combine is to be commissioned in 1962. The mining methods introduced in the Khrustalnyi tin combine (Primorye) in 1960 have been studied by miners from all over U.S.S.R.

In the Dalolovo combine (Yaroslavskyi) in Primorye — tin is now being smelted and two more tin mines were opened in 1960. Tin was still regarded during 1960 as "deficient and expensive", and Soviet tin exports to the west were much smaller than the quantities imported by the U.S.S.R. from China.

MINING MISCELLANY

Work has started on the construction of a railway line 180 miles long to link the rich iron ore deposits at Karagaili, U.S.S.R., with the steel centre of Karaganda. This line will later be extended to Akrogai, to link up with the Moscow-Peking line.

★

Sealed bids received before July 12 are being considered by the Director of Mines, Manila, for the operation of the Parcels Nos. 1, 2 and 3 of the Zambales Mineral (Chromite) Reservation, located in the municipalities of Masinloc, Candelaria and Sta. Cruz, province of Zambales, Philippines.

★

A report from Manila, states that two diamond drilling units have arrived in the Philippines, at Pagadian, Zamboanga del Sur, to start exploration of the rich high-grade magnetite iron deposits at Maltang, Liargao, on behalf of the Bataan Iron and Steel Corporation.

★

The Comision Nacional de Energia Atomica, of Argentina, has reported the discovery of another uranium deposit in the province of Chubut, 200 km. from Rawson.

The Metal Refining Research Institute of Budapest claims to have succeeded in producing gallium from alumina residue. The work has been undertaken in co-operation with alumina producers. A special plant is under construction for processing the fluorine content of bauxite. Alumina output in Hungary last year amounted to 220,662 tonnes, compared with 192,982 in 1959. Alumina plants are reported to be situated at Magyaovar, Ajka and Almafuzito.

★

German geologists, working for the Jordan government, are reported to have discovered copper ores, estimated at 22,500,000 tons near Wadi Araba, in southern Jordan.

★

Mining of phosphate rock deposits in the Kampot Province of Cambodia is reported to have started earlier this year. The deposits, which are estimated to contain 120,000 tonnes of ore, are being worked by Cambodian miners. The Superior Council of the Ministry of Plans has approved the formation of a company to finance the construction and operation of a phosphate plant at Tuk Meas, with an annual capacity of 12,000 tonnes.

The new Model FD-535 Shawnee Poole rear dump hauler (5 cu. yd. 6 ton capacity) powered by 32 b.h.p. Fordson Dexta prime mover, operating in a sand and ballast pit and being loaded by dragline. The large target area of the rear dump, combined with rugged construction, makes the new compact FD-535 highly suitable for the smaller pit or where production is limited; and it gives all the advantages of the Shawnee Poole System with a 110 degree turning angle

Cranes (Dereham) and Fruehauf International Ltd., the overseas organization of Fruehauf Trailer Co. of Detroit, U.S., are to have a joint interest in a new British company, Crane Fruehauf Trailers Ltd. The new British-American company is to build a factory at North Walsham, Norfolk, to produce a full range of commercial semi-trailers, and it is hoped to commence production early in 1962.

★

Head Wrightson Iron and Steel Works Engineering, in conjunction with Société Fives Lille-Cail, has received a £1,000,000 contract for a 3,000 t.p.d. sintering installation from the Société pour le Traitement du Minerai de Saizerais in Lorraine.

★

Canadian Nickel Co., the wholly-owned exploration subsidiary of International Nickel Co. of Canada has signed an agreement with Chibougamau Mining and Smelting Co. for the development of 180 copper-nickel claims at Fortet Lake, some 60 miles north of Chibougamau, Quebec, according to a report in the *American Metal Market*. Canadian Nickel is to spend about $50,000 on an investigation; the same sum has already been spent by Chibougamau on the project. Floats recently found on the property indicated a copper content of about 5 per cent and nickel at 2 per cent.

★

Diamond ore deposits near Huvinahadagalli, about 45 miles from Hospet, India, have been reported, and are to be investigated.

★

Reports on China's coal mines indicate that they require supplies of electric drills, conveyor belts, ventilation equipment, lamps, blasting instruments and colliery trucks, states the *China Association*. It is not known whether China contemplates ordering any of these from abroad, although it is reported that enquiries have been placed in Japan for miners' lamps.

★

Coal deposits located near Loikaw, in Burma, are suitable for a proposed new cement factory. Limestone deposits are also reported to be available in sufficient quantities in the locality.

★

The United Nations Special Fund is to provide $590,400 to meet the cost of a survey to explore, extend and improve the utilization of the lead, zinc and silver ores in the Bawdwin Mine, which is operated as a joint venture by the Burma Corporation and the Burma government. The Burma Corporation will put up about K 1,300,000 to meet Burma's share of the local currency expenses, the remainder being found by the Special Fund.

★

Peruvian Oil and Minerals, through its subsidiary, Marbridge Mines, and acting together with Falconbridge Nickel, plans to develop a nickel property in La Motte, Quebec. Production is planned on a basis of 300 tons per day minimum. Construction of a transmission line to link the property with Quebec Hydro Power has been undertaken. Additions to the Canadian Malartic mill, where the ore will be concentrated, are also being made, and it is expected that ore will be sent for treatment before the end of 1961.

(continued overleaf)

Bulgarian geologists have discovered extensive gypsum layers, some 25-35 metres thick, at a depth of 240 metres, near Vidin. Preliminary investigations suggest that it might be possible to mine about 350,000 tonnes annually.

*

A Summer School on The Design of Instrument and Control Equipment for Use in Explosive Environments was held at Northampton College of Advanced Technology, London recently. It was attended by over 60 engineers and scientists from the oil, chemical explosives and coal mining industries, as well as from firms manufacturing instruments and mining equipment. The lectures gave a broad survey of the whole field, and it was the general experience of contributors that a very wide range of instrument and control equipment could be made safe.

*

The St. Joseph Lead Co. is to close its Bonne Terre lead mine in south eastern Missouri, which has been operating for over 90 years, as a result of the low price of lead. The mine had a daily output of about 1,800 tons of lead ore. St. Joseph had only been operating at about 60 per cent of its rated mill capacity.

*

Aveling-Barford are to supply Taylor Woodrow (Sierra Leone) with 18 SL270 13½ ton Shuttle dumpers, to the value of some £110,000 for work on the Guma Dam project, to increase the supply of water to Freetown. Goodwin Barsby and Co., another member of the Aveling-Barford Group, are supplying the contractors with the aggregate crushing plant for the same project.

Personal

Anglo American Corp. of South Africa announce that Mr. P. H. A. Brownrigg has been appointed a director of the following companies with effect from July 6, 1961: Nchanga Consolidated Copper Mines, Rhodesian Anglo American, Rhokana Corporation, Rhodesia Broken Hill Development Company and Rhodesia Copper Refineries. Mr. W. D. Wilson has resigned as a director of Nchanga Consolidated Copper Mines Limited also with effect from July 6, 1961.

*

The Holman Group has appointed Dr. H. J. Phelps as consultant to two of its companies, Maxam Power and Goodyear Pumps.

*

Mr. C. M. Romanowitz has opened a consulting office at 2034 Santa Clara Avenue, Alameda, Calif., U.S.A. for consultations in dredge application.

*

British Insulated Callender's Cables announce that Mr. C. O. Boyse on relinquishing his appointment as managing director of the Automatic Telephone & Electric Co., has been appointed an executive director of BICC from July 6, 1961.

*

Allis-Chalmers G.B. announce the appointment of Mr. T. H. Kindersley, as chief engineer of the company's engineering products division, at their London office.

The National Coal Board has appointed Mr. C. W. Moss as assistant director-general of their Process Development Department.

*

Mr. E. R. Thomas, who has been managing director of Elcontrol since the company was launched in 1948, has resigned as managing director but remains a director of the company. Mr. B. A. Worswick, who has been chief engineer and technical director, has been appointed managing director.

*

Mr. A. B. Price, sales manager of G.E.C. Engineering Works at Erith retired at the end of June, after 48 years' service with the company. Mr. J. F. Prince, who has been with G.E.C. for 42 years, also retired recently; his place as manager of the export sales department at the Witton Works, has been taken by Mr. K. D. Starr.

*

Mr. Frank A. Seeton has recently been appointed manager of the metallurgical operations division of Denver Equipment Co., Colorado, U.S.A.

*

Mr. P .C. Fryer has joined the Lead Development Association, and will be engaged principally in development work for the lead industry in the battery field.

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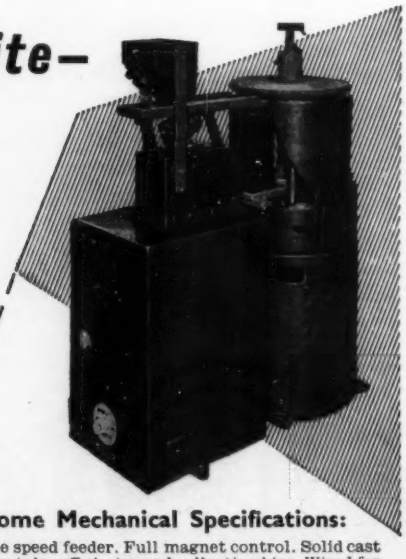

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The Permutit Co. Ltd., who design and manufacture Deminrolit water demineralising equipment, have for many years been a major producer of water treatment plant and ion exchange materials. Since 1937, when Permutit made the world's first plant to produce pure water by ion exchange, a whole range of equipment has been developed to deal with vast quantities of pure water needed for large industrial users and for the comparatively small quantities needed by laboratories and workshops.

The latest unit in this range is the Mark 7 portable Deminrolit unit. This consists of a plastic body accommodating a battery-operated tester and control valves, plus a detachable plastic cartridge containing a bed of intimately mixed Zeo-Karb cation and De-Acidite anion exchange materials. When water passes down through this column, virtually all ionized solids are removed, resulting in demineralized water of a quality satisfying the B.P. specification for purified water.

After treating its rated capacity, the cartridge is replaced by a regenerated one and further treatment can then continue. Permutit have a speedy cartridge exchange system to ensure continuity of supply.

On water of London type, Mark 7 "Deminrolit" will produce about 16 gallons of purified water per cartridge—and much more on moorland type water common in Northern England—the claimed low cost of operating this unit is apparently of interest. Added to this, the company claims advantage of the ion exchange process: no scale or sludge, simplicity in operation, constant flow rates and purified water of consistent quality—monitored continuously by the tester.

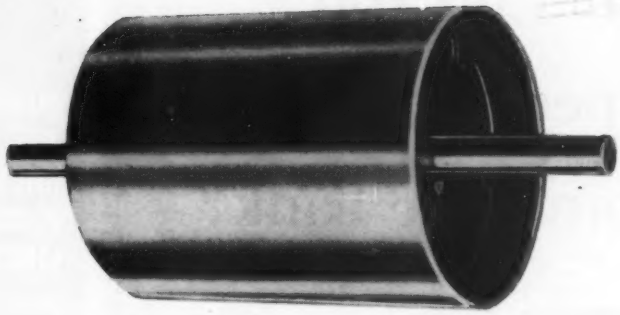
The introduction of the Mark 7 portable Deminrolit unit in no way affects the availability of the larger portable Deminrolit units which operate on similar principles but are equipped for regeneration on the spot.

USE OF ANTI-VIBRATION MOUNTINGS

Mounting heavy machinery on rubber-to-metal bonded anti-vibration units is a practice that is gradually growing in this country, for it has great advantages in that it avoids costly and extensive foundations and enables heavy machinery to be moved readily from one place to another. It has definite applications in the mining and metallurgical industries.

The Phoenix Rubber Co. Ltd., who are producing such anti-vibration mountings, recently decided to use them when installing a new 60 in. rubber mixing mill in their own factory. The mountings they used were designed by their Associates Gesellschaft Fur Technischen Fortschritt, MBH. of Koblenz who have extensive experience in anti-vibration problems. Phoenix were able to install their 22 ton mill on a 5 in. bed of concrete compared with 4 ft. 6 in. usually necessary for such an installation and simply lowered the machine on to a number of carefully sited and aligned Getefo mountings.

Phoenix claim that, using these mountings, and advice from their associates, the engineering staff of an average factory can carry out similar installations with a considerable saving of time and money.



Rapid permanent magnetic pulley with Andox 5 magnets

★

An ultrasonic flowmeter has been developed by the British Scientific Instrument Research Association in conjunction with the National Research Development Corporation, states the D.S.I.R. report *Research for Industry 1960* (H.M.S.O. 8s. 0d. net), and several members are manufacturing it. This instrument, which should be on the market during 1961, is capable of measuring flow to an accuracy of better than 1 per cent and can be applied to any kind of liquid as long as the viscosity is not too high. Since there is no working element in the pipe corrosive liquids can be measured; there is no pressure drop at the detecting head.

NEW DESIGN MAGNETIC SEPARATOR

Rapid Magnetic Ltd., announce their new range of Andox 5 permanent magnet pulleys for extracting tramp iron from processed materials.

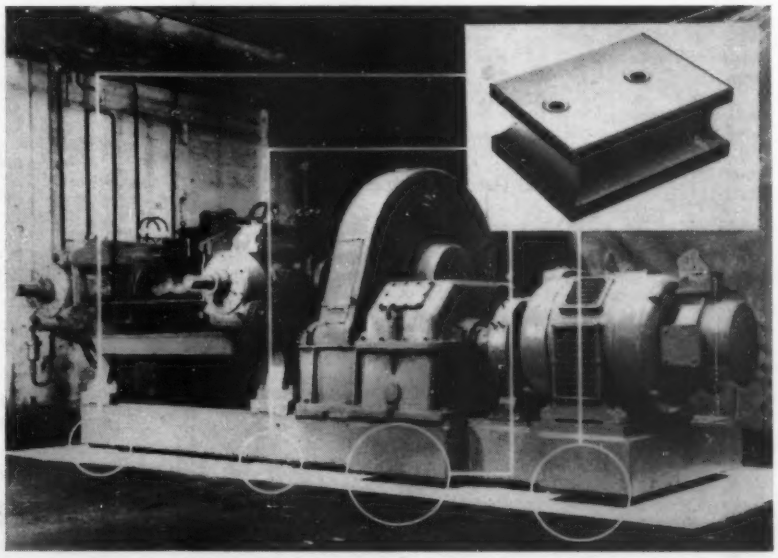
The superior field intensities so produced are equivalent to those of electromagnetic designs, with flux distribution patterned to conform to the burden contour on the belt conveyor. Highest intensity occurs at the centre of the conveyor where burden depth is greatest.

Possessing unusual pulling and holding power and using stainless steel covers for long mechanical life, the pulleys are available in a range of sizes from 12 in. to 24 in. dia. for any belt width.

★

A modified design of the Sala round aperture valve is now available in small sizes. The outer casing is of cast aluminium and closure is effected by hydraulic or pneumatic pressure on the rubber muscle as in the standard valve. The inner liner of neoprene is, however, extended and recessed to fit over a standard steel pipe and to be secured with hose clips. This type is now produced with 1 in., ½ in. and ¼ in. bores and intermediate sizes can be supplied to order. The aperture remains completely round from full bore to closure and the valves are ideally suited for control of slimes.

The 22 ton rubber mixing mill with (ringed) the sites of the Getefo mountings (inset)



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Metals and Minerals

Prospects for Silver

Prompted by recent predictions of a critical shortage of silver in the near future, Handy and Harman have issued a statement deprecating the likelihood of any deficit for industrial needs. Conceding that the use of silver had exceeded mine production for several years, the company pointed out that this was not the whole story. Historically, there have always been secondary sources of silver becoming available at different price levels.

Such secondary sources, it was stated, have included demonetized coin from various countries including the U.K., Mexico, Cuba and Saudi Arabia. Among these sources is the U.S. Treasury, which for many years has been selling silver to industry from its free stocks at 91 c. an oz. at the San Francisco Mint. Transporting this silver to the big eastern consuming markets adds ⅛ c. for freight and other charges, making the cost to the user 91⅛ c.

The real question about the future of silver, it was emphasized, is one of price. For the short term, so long as the U.S. Treasury maintains its present silver policies, the outlook is for continued price stability in the U.S. In time, however, Treasury silver will no longer be available and eventually higher price levels can be expected. In Handy and Harman's view, however, the price will not go anywhere near as high as $1.29 an ounce, this being what the government would charge for silver through the presentation of silver currency certificates calling for payment in silver on demand.

Similar views were expressed by the company in its review of the silver market in 1960. It may be recalled that Simon Montagu and Co. Ltd., in their *Annual Bullion Review*, 1960, also expressed the opinion that in the long term the prospect of higher prices seemed inevitable, but they pointed out that silver production, being mainly a by-product of base metal mining, does not necessarily expand with rising silver prices. In their view the prospects of substantial additional non-production supplies are doubtful.

U.S. government stocks of free silver on July 5 were 79,294,897 oz., as compared with 123,500,000 oz. at the end of December, 1960, and 175,100,000 oz. at the beginning of 1960. U.S. coinage requirements accounted for about half the decline in stocks and purchases by American industrial users for the rest.

At the current rate of depletion the free stocks held by the U.S. Treasury would last about 10 months more. The Treasury, however, has about 13,200,000 oz. of silver returned from foreign countries under previous lease-lend arrangements, which have not as yet been put into free stocks. An additional 30,000,000 oz. owed to the government under lease-lend has yet to be repaid.

It and when U.S. Treasury free stocks become exhausted, a major change in U.S. policy and legislation would be required before any part of the Treasury's monetary reserve of silver became available to consumers.

ITALY'S NEW PYRITES PLANT

The annual report of the Montecatini Mining and Smelting Co. reports the start of construction at the new pyrites plant at Casone, near Follonica, in Grosseto province, where pyrites from the Tuscan marshes will be treated. Construction is scheduled for completion by June 1962. Initial production will be 1,000 t.p.d. of concentrated sulphuric acid and 550 tons a day of ferrous minerals of high tenor. Patented processes will be used to extract ferrous minerals from the pyrites as a primary product instead of as the usual by-products in a sulphuric acid extraction process.

Aerial conveyors will carry the pyrites from the Niccioleta mine at Massa Marittima (Grosseto) to the plant at the rate of 1,300 tons daily. The ore will be roasted in two furnaces to liberate sulphuric anhydride. The solid iron-oxide residue (about 65 per cent iron) will be purified and formed into pellets for shipment to steel manufacturers. The sulphuric anhydride will be transformed into sulphuric acid in an adjoining plant. Montecatini will absorb part of the sulphuric acid produced, the balance being sold on the open market.

This new sulphuric acid supply will add to the problems facing the Italian sulphur industry, which has difficulty in disposing of its present output because of high production costs.

QUICKSILVER CHEAPER

The day-to-day level of demand for quicksilver on a London ex-warehouse basis has lately been at a low ebb, the shaky undertone being due apparently to the availability of supplies from the smaller producers such as Mexico, Chile, Peru and Turkey. Owing to the reduced demand these supplies have probably been having a greater impact on the market than would otherwise have been the case. In general, however, the overall supply position appears fully adequate for present needs, and with the market entering the seasonally quiet period, a further reduction in price seemed by no means improbable. This has now taken place and the London ex-warehouse quicksilver price is now indicated at £65 per flask compared with £66 recently. It has fallen from £70 10s. since last October.

Continental interest has slackened, though not to the same extent as in the U.K., for some useful enquiries continue to be made. Further afield India remains a buyer and but for the import licensing system in that country might possibly take more.

U.K. imports from all sources totalled 2,633 flasks in May compared with 2,846 flasks in April. The B.O.T. figures reveal no imports in Russia for the second month running, but subsequent returns are expected to show a resumption of arrivals. It is also believed that some Chinese quicksilver will be arriving later this year; if so, it will be the first time for many years that metal from that country has entered the U.K. Production of quicksilver in Italy is estimated to be running at an annual rate of some 60,000 flasks. Spain's output is reckoned to be at the same rate. The big stocks in Italy which were overhanging the market have been substantially reduced.

U.S. NICKEL PRICES

The General Services Administration in Washington has announced that its sales prices for nickel products effective as of June 30, 1961, were as follows: Electrolytic nickel cathodes 81¼ c. per lb.; nickel oxide sinter 77.5 c. per lb. of contained nickel plus cobalt; special nickel oxide powder 83 c. per lb. of contained nickel plus cobalt. It has been further stated that the quantity limitations on the sale of nickel by G.S.A. will continue unchanged, and that the usual premiums paid by small purchasers of nickel would also be continued. G.S.A. is selling nickel accumulated from operation of the Nicaro plant in Cuba, which has been taken over by the Castro government.

MORE INTEREST IN WOLFRAM

Some revival in demand for wolfram ore has been reported, the tonnage changing hands being described as fair, with prices inside the present range of 128s. 6d. - 132s. 6d. per l.ton unit c.i.f. Europe. Some market sources believe that the buying might have emanated from Japan, as interest currently being shown elsewhere remained slow, especially in the U.K.

CHINESE ANTIMONY EASIER

It is understood that Chinese antimony metal of 99.6 per cent purity is now being quoted at about £177 per tonne c.i.f. U.K. This compares with £181 over the past month or two, before which the price had remained at £186 since early April, following a substantial advance after the £20 per l.ton increase in the U.K. domestic price on April 1. The view has been expressed that the Chinese are rather keen to sell and that a buyer could possibly obtain metal below the current quotation. On a delivered U.K. basis the new price would be equivalent to around £225 per l.ton, after allowing for the 25 per cent import duty on foreign metal entering the U.K. and conversion to a l.ton. The U.K. price for domestically produced 99.6 metal remains at £237 10s. per l.ton delivered.

U.S. GALLIUM AND INDIUM OUTPUT

U.S. domestic production of gallium, and indium, metal increased in 1960, according to the Bureau of Mines, U.S. Department of the Interior. Output and shipment of domestically produced gallium were the largest ever reported, though still measured in hundreds of pounds. Market prices per gram of gallium in 100 gram quantities ranged from $2.25 for 99.99 per cent quality to $3.00 for metal 99.9999 per cent pure.

Gallium continued to be used in small quantities for sealing glass joints and valves in vacuum equipment, and there

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was increased interest in potential electronic application for certain gallium compounds. Gallium arsenide was available for optical and infra-red devices, and transducers, as well as for tunnel diodes used in communication systems, computers and radar receivers. Gallium phosphide was available for uses in missiles and space vehicles.

Domestic production of indium increased but shipments were lower. In addition to its three largest uses in electronics, bearing alloys and low melting alloys, indium salts found applications in plating and there was continued interest in developing ways of using indium arsenide and indium antimonide in electronic devices. The market price for indium metal in quantities up to 100 oz. was $2.25 per troy oz.

JAPAN'S BERYLLIUM CAPACITY

Japan claims to have beryllium metal producing capacity of about 20,000 s.tons a year, equivalent to less than two-thirds of U.S capacity.

Copper · Tin · Lead · Zinc

(From Our London Metal Exchange Correspondent)

The holiday season is now having its full effect on markets and a large part of the turnovers are due to the prolongation of contracts falling due. Prices have remained relatively steady with the exception of copper, where scattered selling, probably on European account, has found buyers reluctant.

No. 2 SCRAP FIRM AT 26 c.

The world price structure for copper has remained relatively unchanged, although in the U.S. custom smelters intake price for No. 2 copper scrap has developed a firmer undertone with the official price at 26 c. per lb., and some smelters paying a little above this figure. The labour picture is also becoming clearer, with the probability that there will be no strike in America, as Kennecott appears to be reaching satisfactory arrangements with all the Unions concerned and the political situation in Rhodesia being less menacing. Against this, new trouble seems to be brewing in Katanga and the negotiations between Anaconda and the unions in Chile are still continuing without any appreciable progress being made.

Consumer demand throughout the world is quiet and stocks in L.M.E. official warehouses showed a further rise of 100 tons to a total of 19,977 tons. This tendency has developed in spite of rumours that the U.K. bank rate is likely to be raised in the near future and must therefore be attributed to European fears about a possible alteration in the sterling exchange rates. A slightly firmer undertone was imparted to the market at the beginning of the week by the U.S. Copper Institute figures which showed a substantial reduction in producers stocks throughout the world. The details are:—

Inside U.S.

Refined copper production in June 141,140 s.tons as against 148,961 s.tons in May.

Deliveries to consumers rose to 139,700 s.tons as against 131,847 s.tons in May.

End of month stocks were 89,008 s.tons as against 106,982 s.tons at the end of May.

Outside U.S.

Refined copper production fell to 166,319 s.tons as against 169,550 s.tons in May.

Deliveries fell to 197,847 s.tons as compared with 208,516 s.tons in May.

End of month stocks fell to 314,051 s.tons as compared with 322,341 s.tons in May.

RELEASE OF TEXAS SMELTER TIN

The tin market has become very much less active, but in spite of fairly wide fluctuations in Singapore the London quotations have remained relatively stable at a slight decline. Metal continued to flow from the U.K., stocks falling by 305 tons during the week to a total of 6,485 tons.

The first release of the Texas smelter tin has now been announced and amounts to 500 tons, which is stored near the industrial areas around Pittsburgh. The interesting feature is that the metal is to be sold by tender and that bids from overseas buyers will be considered. Export of the metal, however, will be subject to the normal U.S. export regulations.

On Thursday the eastern price was equivalent to £924½ per ton c.i.f. Europe.

LEAD WEAKER — ZINC STEADY

The lead market, after developing a firmer tone towards the end of last week, once more became weak on Tuesday with considerable offerings, believed to be of a hedging nature, which met with little buying interest. Stocks rose by 185 tons to a total of 13,068 tons and the contango rate remains unchanged.

The zinc market has been relatively steady with stocks only falling 83 tons to a total of 6,809 tons, and turnovers being almost entirely confined to the extension of contracts falling due. The American Zinc Institute figures for June showed that deliveries exceeded production by some 5,000 s.tons, the particulars being:—

Production — 72,816 s.tons against 73,623 s.tons in May.

Shipments — 78,050 s.tons against 79,599 s.tons in May.

End of month stocks fell to 207,820 s.tons from 213,054 s.tons at the end of May.

OFFICIAL TURNOVERS

Official turnovers (in l.tons) for the week ending July 14, with the previous week's figures in parentheses are:—

Copper	12,975	(21,075)
Tin	1,380	(1,775)
Lead	11,125	(9,850)
Zinc	7,700	(9,100)

Closing prices are as follows:

	July 13		July 20	
	Buyers	*Sellers*	*Buyers*	*Sellers*
COPPER				
Cash	£228	£228½	£228	£228½
Three months ..	£233	£233½	£231½	£231½
Settlement ..	£228½		£228½	
LEAD				
Current ½ month	£64½	£64½	£65	£65½
Three months ..	£65½	£65½	£66½	£66½
TIN				
Cash	£911	£912	£912½	£913
Three months ..	£924	£925	£923	£923½
Settlement ..	£912		£913	
ZINC				
Current ½ month	£77½	£77½	£77½	£78
Three months ..	£78½	£78½	£79½	£79½

LONDON METAL AND ORE PRICES, JULY 20, 1961

METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £230 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 11s. 0d. lb.
Cerium (99%) net, £15 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 12s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 252s. 3d.
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram
Magnesium, 2s. 2½d./2s. 3d. lb.
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £660 per ton
Osmium, £17/£22 oz. nom.
Osmiridium, nom.
Palladium, Imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £27½/£28
Quicksilver, £65 ex-warehouse
Rhodium, £43/£45 oz.
Ruthenium, £14/£16 oz. nom.
Selenium, 46s. 6d. per lb.
Silver, 79½d. f. oz. spot and 80½d. f'd.
Tellurium, 37s. 6d. lb.

ORES AND OXIDES

Antimony Ore (60%) basis	30s. 0d./35s. 0d. per unit c.i.f.
Beryl (min. 10 per cent BeO)	270s./275s. per l. ton unit BeO
Bismuth	30% 5s. 0d. lb. c.i.f.
	20% 3s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semifriable 48%) (Ratio 3 : 1)	£15 5s. 0d. per ton c.i.f.
,, Hard Lumpy 45% .. .. (Ratio 3 : 1)	£15 10s. 0d. per ton c.i.f.
,, Refractory 40%	£11 0s. 0d. per ton c.i.f.
,, Smalls 44% .. .. .. (Ratio 3 : 1)	£13 5s. 0d. per ton c.i.f.
Baluchistan 48% .. .. (Ratio 3 : 1)	£11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10:1) $Nb_2O_5 : Ta_2O_5$	160s./165s. 0d. per l. ton c.i.f.
Lithium Ore—	
Petalite min. 3½% Li_2O	50s. 0d./55s. 0d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O	76s. 0d./80s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li_2O	75s. 0d./85s. 0d. per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite Raw (ground)	£21 0s./£23 0s. d/d
Manganese Ore Indian—	
Europe (46%-48%) basis 60s. 0d. freight	73d./75d. c.i.f. nom.
Manganese Ore (43%-45%)	69d./71d. c.i.f. nom.
Manganese Ore (38%-40%)	nom.
Molybdenite (85%) basis	10s. 0d. per lb. (f.o.b.)
Titanium Ore—	
Rutile Australian 95/97% TiO_2 (prompt delivery)	£20 10s./£21 0s. per ton c.i.f.
Ilmenite Malayan 50/52% TiO_2	£11 10s. per ton c.i.f.
Ilmenite Travancore 58/60% TiO_2	£5/£5 10s. per ton c.i.f.
Wolfram and Scheelite (65%)	128s. 6d./132s. 6d. per unit c.i.f.
Vanadium—	
Fused oxide 95% V_2O_5	7s. 6d./8s. per lb. V_2O_5 c.i.f.
Zircon Sand (Australian) 65-66% ZrO_2	£16 ton c.i.f.

Mining Finance

British Tin's Capitalization Issue

Last week the position and prospects of London Tin Corporation were discussed here. Since then another of the big tin investment companies, British Tin, has announced a 1 per cent higher interim at 8 per cent on the 10s. shares. At the same time it is following London Tin's example in making a 20 per cent capitalization issue to shareholders, although there is the complication in this case that the shares are also to be split into a denomination of 5s.

The mechanics of the issue are that shareholders on the register at the close of business on August 8 are to be allocated, by the capitalization of part of the share premium account, two new shares of 5s. for every five shares of 10s. then held which means that in effect they are getting one for five in terms of the new 5s. denomination.

The new shares will not rank for the interim and it is stated that the final "will be determined in the light of results and no other inference should be drawn from the proposed capitalization issue". Nevertheless, in the light of London Tin's forecast that it should be able to maintain the distribution on its capital as raised by a similar issue, it is a fair assumption that British Tin should also be able to do so.

If it does no more than merely hold the final at 27 per cent, making an equivalent 33⅓ per cent for the year, the potential yield on 18s., the ex dividend, ex capitalization and share split equivalent of 43s. 9d. the present price would be 9.3 per cent.

TANJONG OVER THE WORST?

Since we wrote about Tanjong Tin Dredging here last week the company has published its June quarter output and interim dividend. Both are poor. The second interim is halved at 6d. per 5s. share. Even so, it makes the payments to date for 1961 at 1s. 6d. only 1½d. below the total of the first two interims last year when distributions eventually reached 4s. 1½d.

Ore sales for the June quarter were 131 tons compared with 193¼ tons in the March period and with 229¾ tons in the December quarter. This means that sales for the first half of the current year at 324¼ tons are running below the total sales of 939 tons achieved for the whole of last year. However, this included sales from stocks amounting to no less than 214 tons, actual output in 1960 being only 725 tons. Thus, as only a very small element of this year's sales can be from stocks, net shortfall on production over the half-year amounts to about 38 tons.

All this should not, however, be read too bearishly for Tanjong shares at 27s. 3d. against a recent peak of 36s. 6d because with the return comes an official statement which says that during the past quarter the output was below normal owing to the dredge having to treat an abnormal proportion of tailings in consequence of an alteration in course. The dredge is now on its southerly course and "a return to good average rate of production is expected". At the same time the higher metal price will have been cushioning the effect on profits of the lower sales.

The next interim is due in October to coincide with the September quarter's return which should mark the hoped for recovery in output. Tanjong yield fully 15 per cent on their 1960 payment. An above average return should, of course, be looked for from a single-dredge concern owing to the inevitable fluctuations in its fortunes caused by the varying grade of ground passed through—fluctuations which usually have rather less overall impact on a multi-dredge company. Nevertheless, Tanjong look worth keeping at their present price.

London Market Highlights

A pall of gloom hung heavily over virtually all sections of the Stock Exchange at the beginning of this week. But as far as the mining sections were concerned, only the tin group suffered. Losses here were very severe indeed. Already uneasy after its swift advance of recent weeks, the tin share market plunged heavily when London profit-taking gathered pace. Even so, the falls were out of all proportion to the actual amount of stock being offered and it was significant that the East, though disinclined to buy, was never a seller. If it had been, the tin market would have become easily the weakest section of the Stock Exchange to be seen for many a day.

The heaviest loss on Monday was a slump of 6s. to 50s. in Ayer Hitam, the shares having been up to 64s. a week or two ago. Among the many smaller falls, Southern Malayan at 31s. and Tronoh at 76s. 6d. each lost 3s. 6d. The market began to steady a little on Tuesday and Wednesday brought a selective recovery. Sungei Besi rallied to 50s. 6d. from Monday's low of 48s. 6d. and Ayer Hitam were looking a little happier at 51s. 6d. London Tin at 19s. showed no improvement, however, there being the consideration that if the prescription for our economic ills contains a dividend freeze, the medicine will be especially unpalatable for tin investment companies which have yet to reflect in their own distributions the full benefit of the rising dividend income now being received.

Gold shares, always contrary it seems, stood well aloof from the gloom elsewhere. A modest but persistent investment demand made its impression in the finance group where Gold Fields were especially strong, rising 5s. 9d. to 50s. in three days. Also better were Union Corp. (45s. 6d.) and Anglo American (112s. 6d.).

The shares of the mines themselves were often a few pence better but here and there an occasional small loss appeared which had no very obvious reason. The answer to this was that a form of arbitrage business was being done in a small way. In essence, the system entails taking advantage of the variations between prices of individual stocks here and in Jo'burg. The procedure is to buy in London a share which is standing at a big discount on its Cape price. The share is then sold at a profit in Johannesburg and the proceeds are reinvested in another share at the Cape which is standing at a relatively smaller discount in London. The money returns when the second share is sold here. A profit can be made in this way but there are many technical difficulties not mentioned here to be overcome, and thus these deals are very limited and are some way yet from establishing an even discount throughout the mines. However, it does explain some of the peculiar movements on the London Market.

Among the mines to improve, Free State Geduld climbed back to 75s. 7½d. from 73s. 9d. and St. Helena perked up to 53s. 9d. The unlucky Freddies Consolidated hardened a few pence to 1s. 9d. after the quarterly's news of hopeful drilling results on the Elsburg reefs.

There was an even more remarkable brightening in the Rhodesian copper section. Buyers decided that in view of the extremely high yields offered by first class companies here that the time had come to take a slightly more optimistic view of the political situation. The amount of buying was, of course, quite small but in the markets' sensitive state share prices were quick to respond. Nchanga (46s. 9d.) and Chartered (62s. 6d.) each rose 1s. 3d.. A gain of 2s. 6d. to 45s. 9d. in Rhokana was helped by hopes that this mine will follow Nchanga's example and maintain its final dividend which is due in October.

GOLD FIELDS AUSTRALIAN

With the fading away of its Mount Ida gold mine in Western Australia, Gold Fields Australian Development has been making steady returns of capital over the past five years which have reduced the outstanding amount from £500,000 in 5s. shares to £100,000 in 1s. shares. It has now been decided to postpone any further repayment for the time being. The reason is that Mount Ida looks like being able to continue operations for rather longer than expected.

Development work in the southern section has indicated the possible availability of a tonnage of "good grade" gold ore. The mining of this will mean some additional plant plus certain maintenance work which had previously been left in abeyance, but it is expected that the extra expenditure involved can be met out of 1961 revenue. Meanwhile, exploratory work in the northern section of the mine, so far unsuccessful, is being suspended in order to concentrate on the latest find. If this should prove to extend for any great distance it is possible that a new shaft might prove worthwhile.

The operating company, Moonlight Wiluna Gold Mines, a wholly-owned subsidiary of G.F.A., would obviously not be able to finance this out of revenue. It is mainly to cover this possibility that G.F.A. has decided to conserve the group's net cash assets for the time being. These amounted to approximately £170,000 on June 30 equal to 1s. 8½d. per G.F.A. share, currently quoted at 1s. 6d.

IRONY IN KAFFIRS

It is all rather ironic that the South African gold share market can do no more than move sluggishly upwards in the present unsettled state of London stock markets generally. Because here is a classic situation in which gold shares would normally have been in strong demand. Sterling is in doubt. There is the prospect of adverse U.K. government measures including, perhaps, dividend limitation. Such measures would not apply to the South African mines which are domiciled in Johannesburg.

It is even conceivable, in fact, that the dis-investment trend which finally drove the South African government to its restrictive measures on capital export last month might by now have been halted as a result of weakness in the British economy. As it is these very measures have been the last straw in dissuading investors from choosing Kaffirs as a haven for part of their funds. They have instead sought other outlets including, it is worth noting, Australian and Canadian gold shares.

How purely political this South African allergy is has been strikingly illustrated by the latest monthly and quarterly reports (the latter will be fully analysed in next week's supplement) which have once again shown how this industry flows on from strength to strength with ever fresh production and profit records. There are naturally some dark patches. There always are in mining. But generally it is a happy story and there is little indication at the moment that it is likely to become otherwise.

The June monthly returns are summarized in the accompanying table. Once again that of West Driefontein is outstanding with yet another profit record of only a little short of R 2,500,000, still comfortably ahead of its main rival Western Holdings which achieved a new peak of R 2,050,000. Both these big money-earners are already well caught up in the South African tax net so that their earnings are virtually true ones, subject from a dividend viewpoint only to capital expenditure requirements. This particularly applies to Western Holdings which put by, last quarter, as much as 62 per cent of its gross working profit for taxation and State's share of profit. Even after this deduction the record June monthly surplus equals an annual net earnings rate of 124 c. per R 0.50. share.

Capital expenditure offsets are still keeping West Driefontein's tax liabilities down to around 50 per cent of profits. In this case the peak June figure is equivalent to a net annual earnings rate of just over 100 c. a share after allowing for uranium loan repayments.

Other mines to put up record profits last month were Doornfontein, Libanon, Vlakfontein and Free State Geduld.

Idris Hydraulic.—Extracts from the chairman's statement are published on page 79. The last financial year was outstanding for Idris Hydraulic, its operations were discussed in these columns in our issue of July 27, 1961.

Consolidated Mines Selection.—An interim dividend of 1s. 0d. has been declared in respect of the financial year to December 31, 1961. The interim dividend is unchanged from the previous year when a final dividend of 1s. 6d. was declared bringing the total for the year to 2s. 6d.

Rand and Orange Free State Returns for June

GOLD OUTPUT AND PROFIT

Company	June 1961 Tons (000)	June 1961 Yield (oz.)	June 1961 Profit† (R000)	Year ends	Current Financial Year Total to date Tons (000)	Current Financial Year Total to date Yield (oz.)	Current Financial Year Total to date Profit† (R000)	Last Financial Year Total to date Tons (000)	Last Financial Year Total to date Yield (oz.)	Last Financial Year Total to date Profit† (R000)
Gold Fields										
Doornfontein	120	51,012	594·6	J	1,318	547,958	6022·0	1,160	470,800	4687·9
Libanon	118	29,517	159·9	J	1,405	339,999	1755·6	1,350	318,371	1405·0
Rietfontein	12	3,181	3·2	D	72	19,429	17·2	96	25,038	76·7
Robinson	44	9,700	2·7	D	256	58,005	15·5	270	58,712	L18·1
Simmer & Jack	70	12,579	2·7	D	418	75,995	0·2	458	81,173	L95·6
Sub Nigel	66	15,036	26·1	J	793	180,468	334·6	793	184,839	443·0
Venterspost	126	37,485	192·8	J	1,464	418,992	1973·1	1,503	384,809	1500·5
Vlakfontein	53	19,570	188·0	D	314	115,544	1114·0	309	110,545	1044·6
Vogels	80	17,148	26·0	D	485	103,755	168·6	515	110,673	246·7
West Drie	175	137,812	2379·3	J	1,644	1,498,389	26261·3	1,360	1,248,882	21519·4
Anglo American										
Brakpan	142	18,577	56·5	D	855	107,899	261·1	852	103,264	145·6
Daggas	227	45,871	459·5	D	1,354	273,961	2720·4	1,392	281,004	2735·9
East Daggas	108	18,436	83·5	D	644	110,068	506·5	630	106,814	484·8
F. S. Geduld	98	85,942	1394·0	S	865	753,130	12253·6	844	725,570	11630·7
President Brand	128	100,135	1705·0	S	1,090	860,498	14892·0	1,043	850,687	14949·0
President Steyn	110	41,177	331·6	S	968	362,106	3047·1	914	355,640	3228·1
S.A. Lands	112	22,441	103·9	D	642	130,111	608·9	576	119,830	515·6
Springs	94	13,630	45·0	D	560	77,980	205·8	617	85,873	175·6
Vaal Reefs	107	50,023	543·6	D	626	293,120	3182·8	578	260,326	2704·8
Welkom	104	32,797	133·7	S	888	282,050	1208·5	881	277,908	1329·7
Western Holdings	175	120,313	2050·4	S	1,476	1,011,548	17263·6	1,307	864,848	14269·1
West. Reefs. Ex.	155	45,184	318·7	D	893	259,679	1761·4	836	235,643	1572·7
Central Mining										
Blyvoor	142	88,761	1346·8	J	1,622	1,046,542	15965·4	1,530	1,003,329	15197·5
City Deep	117	24,054	6·0	D	681	141,522	43·8	672	139,598	64·6
Cons. M.R.	43	8,210	3·7	J	591	125,200	75·4	971	188,506	232·4
Crown	176	30,556	1·6	D	1,086	188,903	14·6	1,192	201,488	62·4
D. Roodepoort	194	36,615	97·3	D	1,145	212,520	594·7	1,148	210,337	590·3
East Rand Prop.	240	55,295	160·4	D	1,418	316,787	784·6	1,311	328,994	1045·6
Harmony	196	78,897	763·9	J	2,116	857,794	8181·4	1,760	703,876	6270·3
Modder East	59	6,310	L1·0	J	1,043	107,959	15·3	1,629	158,172	93·8
Rose Deep	23	4,158	1·0	D	134	24,258	L4·9	148	25,759	14·6
J.C.I.*										
Freddies Cons.	65	12,927	L29·9	D	379	78,565	L296·3	353	79,444	L510·6
Govt. G.M.A.	34	6,652	L30·0	D	248	50,791	L82·3	317	64,835	6·1
Randfontein	18	2,568	1·2	D	103	17,762	8·7	140	27,145	37·2
Union Corporation										
East Geduld	125	35,125	415·8	D	758	215,836	2612·7	798	234,874	3043·7
Geduld Prop.	80	12,882	40·0	D	470	75,578	255·4	439	78,927	290·3
Grootvlei	218	45,142	441·3	D	1,295	268,086	2617·7	1,286	267,937	2725·0
Marievale	99	23,760	238·4	D	587	141,689	1446·0	591	144,661	1503·9
St. Helena	187	65,459	844·6	D	1,091	382,776	4908·7	952	320,630	3958·3
Van Dyk	74	11,472	11·7	D	441	69,952	81·7	435	72,982	114·2
Winkelhaak	96	32,640	350·0	D	567	193,009	2080·2	500	155,652	1416·9
General Mining										
Buffelsfontein	152	66,458	760·0	J	1,781	754,854	8478·0	1,726	671,607	7055·9
Ellaton	24	5,631	28·2	D	148	34,518	189·0	171	40,513	302·7
S. Roodepoort	30	7,170	46·8	J	356	85,863	545·4	358	85,528	546·4
Stilfontein	179	80,600	860·1	D	1,052	476,056	5133·9	950	427,930	4459·3
W. Rand Cons.	134	20,121	47·4	D	797	118,550	205·9	783	112,070	69·1
Anglo Transvaal										
Hartebeestfontein	136	62,235	721·5	J	1,522	704,823	8081·3	1,237	604,577	7231·5
Loraine	85	25,288	63·8	S	744	188,280	L3·8	702	146,507	L358·5
Rand Leases	190	25,650	L37·1	J	2,272	316,607	5·8	2,226	333,353	534·7
Village M.R.	36	3,951	L5·0	J	384	49,773	L70·3	365	55,966	17·4
Virginia O.F.S.	142	28,294	L129·0	J	1,518	316,500	L923·2	1,595	356,897	301·6
Others										
N. Kleinfontein	78	10,288	6·1	D	444	60,751	36·6	469	60,851	12·7
Wit Nigel	20	4,278	7·5	J	238	52,206	112·5	227	52,477	127·5

Gold has been valued at 251s. 0d. (May 250s. 6d.) per oz. fine. L indicates loss. †Working Profit. Tables exclude profits from Uranium, Pyrite and Acid, and also production from Uranium divisions at Randfontein and W. Rand Consolidated.

ESTIMATED URANIUM REVENUE

Company	Year ends	June Profit (R000)	This year (cum.) (R000)	Last year (cum.) (R000)
Gold Fields				
Doornfontein	J	32·0	361·0	358·0
Luipaards Vlei (*a*)	J	250·0	2536·5	2365·6
Vogels	D	112·0	661·0	656·0
West Drie	J	102·0	1192·0	1196·0
Anglo American				
Daggafontein (*b*)	D	253·0	1539·0	1698·0
P. Brand (*b*)	S	92·0	801·8	835·0
P. Steyn (*b*)	S	126·0	1106·2	1105·3
Vaal Reefs (*b*)	D	148·0	877·8	1713·8
Welkom (*b*)	S	119·0	1052·1	1054·3
West Reefs Ex. (*b*)	D	99·0	592·2	1955·4
Central Mining				
Blyvoor (*b*)	J	312·0	3779·0	3698·3
Harmony (*b*)	J	384·6	5360·5	5024·1
J.C.I.*				
E. Champ d'Or (*a*)	D	9·0	58·0	84·6
Freddies Cons. (*b*)	D	65·0	389·0	362·0
Govt. G.M.A.‡	D	38·0	248·0	276·6
Randfontein (*b*)(*c*)	D	279·8	1665·2	1307·1
General Mining				
Buffelsfontein (*d*)	J	263·0	4382·0	5080·0
Ellaton (*d*)	D	4·4†	23·2	212·0
Stilfontein (*d*)	D	11·0†	230·0	1076·0
W. R. Cons. (*c*)(*d*)	D	306·4	1992·4	2520·5
Anglo Transvaal				
Hartebeestf'tein(*d*)	J	403·0	5529·0	6249·3
Loraine (*d*)	S	68·0	610·0	630·0
Virginia O.F.S. (*d*)	J	298·6	3982·3	4249·4

Tables include profit from uranium, acid and pyrite, before loan redemption. (*a*) Including profit from gold section. (*b*) Including royalty provision. (*c*) Total profit from uranium section. (*d*) Excluding royalty provision. *Net revenue. †Uranium royalty received. ‡Pyrite.

Company News

On July 17, Mr. Ronald Soothill, chairman of Turner & Newall Limited, laid the foundation stone of the new £2,500,000 factory that Ferodo Ltd. (a member of the Turner & Newall Group) is building at Caernarvon. The factory will produce textile brake linings and clutch facings, and Ferodo non-slip stair-treads. The project should be completed by April 1962.

★

F. Perkins Ltd. have signed an agreement for three, four and six-cylinder Perkins diesel engines to be manufactured under licence by Fast S.A. Commercial e Industrial, of Buenos Aires. The project has the approval of the Argentine government, and Fast S.A. will shortly change its name to include Perkins in the company's title.

★

Associated Electrical Industries has received an order from West Germany for a Metroflux Type 'T' universal magnetic crack detector. The Type 'T' unit, is to be supplied to Klockner Humboldt Deutz of Cologne.

★

Flexible Ducting has won an order for over 2,200 ft. of ventilation tubing for use in the Emperor Gold Mines, Fiji. The order was placed by the London confirming house, Austral Developments Ltd.

★

BTR Industries has been awarded a further order for conveyor belting, for service in the U.S.S.R. This order, for over five miles of belting, is worth over £250,000. Negotiations commenced during the recent British Trade Fair in Moscow.

★

The Electrical Research Association's new Creep of Steel Laboratory at Leatherhead is concerned with the improvement in the efficiency of generation of electricity, primarily in steam-driven turbo-alternator sets, and is the latest stage of a long investigation that has developed continuously over nearly forty years. In that period, steam raising conditions at power stations have risen from 600 p.s.i. and 680 deg. F. (565 deg. C.). The overall efficiency has consequently increased from under 20 per cent to 34 per cent in some cases. This improvement has been possible as a result of research on the high temperature properties of the steels used in the generating plant, with which the E.R.A. has been actively associated.

★

The Tsumeb Corporation of South West Africa is constructing new metallurgical plants at a cost of $20,000,000. A new lead smelter and refinery is scheduled to come into operation in 1963, and a new copper smelter by 1962. Until their completion, Europe and the U.S. will continue to smelt and refine Tsumeb ores. In addition, a differential flotation plant, with a capacity of 750 tons daily, under construction at Asis, 65 miles from Tsumeb, should be in production by 1962. The Asis mine has developed reserves totalling 2,000,000 tons of 3.6 p.c. copper, 4.4 per cent lead and 0.5 per cent zinc. The latest plant to come into operation at the mine is the semi-refined, high-grade, germanium dioxide plant, with an annual capacity of 10,000 lbs., which recovers byproduct germanium. The concentrate is shipped to the U.S. for refining.

RUSSIANS SEE BRITISH COAL INDUSTRY

A party of Russians, comprising in the main mining engineers with some geologists, last week concluded a visit to Britain which seems to have been timed to coincide with the Soviet Exhibition at Earls Court. During the brief visit the party requested permission from the National Coal Board to visit collieries in this country and asked to see something of British mining methods and education.

In answer to this request the party initially was given a short talk by Mr. H. R. King, deputy director general, Production and Reconstruction Department, N.C.B., and on the same day, Monday, July 10, travelled to Leicester.

On Tuesday, July 11, the Russians visited Donisthorpe Colliery and were conducted on an underground tour of the workings. In the afternoon they travelled to Leeds and visited the Mining Department of Leeds University the following day.

Later that afternoon the party travelled to Newcastle-on-Tyne. In a brief tour of the north-east the Russians were shown Easington Colliery, Co. Durham, during the morning of Thursday, July 13, and in the afternoon of the same day they were taken to the Acorn Bank opencast site in Northumberland.

During the tour, which lasted until the end of the week, Nottingham and the plant of Dowty Mining Equipment Ltd. at Ashchurch were also visited.

The leader of the Russian group was Dr. Aleksei Sudoplatov, professor at the Institute of Mining at the Soviet Academy of Sciences.

CHANGE OF ADDRESS

The Geological Survey of Norway is being transferred to Trondheim on August 1 next. The new address will be: Norges Geologiske Undersokelse, P.B. 3006, Ostmarkneset, Trondheim, Norway.

★

Cranes (Dereham) Ltd., and Crane Fruehauf Trailers Ltd., have moved their London office. Their new address is: 8 York Buildings, Adelphi, London, W.C.2. Telephone. TRAfalgar 1781.

★

Simon-Carves announce that their Coal Preparation and Mining Division is being transferred to Carlisle, and after December 31 next their address will be: Simon-Carves Ltd., P.O. Box No. 26 Durranhill, Carlisle.

New, unused, 'SIEBE GORMAN' Proto No. 2, Mark IV, two hour breathing apparatus sets, complete and perfect in steel case, ex M.O.S., 100 available at £20 each; also 60 ditto except less rubber bag, at £12 10s. each, carr. paid inland.

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SIXTH INTERNATIONAL MINERAL PROCESSING CONGRESS

The sixth International Mineral Processing Congress will be held in Cannes from May 26 to June 1, 1963. Organization is in the hands of la Société de l'Industrie Minérale and the following executive committee has been appointed: President, Mons. R. J. Testut; General Secretary, Mons. Pierre Gy; Members MM. Astier, Emery, Ploix, Rey, Saint Guilhem, Saverot, Seyer, Vielledent and Vuchot.

As in the past, this Congress will be concerned with all aspects of mineral processing and papers will be selected entirely on the basis of their scientific and technical value. However, the Committee wish to place particular emphasis on the following subjects:

1. The concentration of iron minerals including magnetic roasting but excluding agglomeration.
2. Measurement, control and automation.
3. Hydrometallurgy.

Especial importance is also attached to the economic aspects of mineral processing and it is hoped that, whenever possible, authors will include data on installation and operating costs and comparative costs for alternative processes.

Scientists and engineers wishing to submit papers for the Congress should send a plan and a short summary of the intended subject matter together with a note on the original aspects and conclusions of the work to the Representative for the United Kingdom and the Commonwealth, Professor M. G. Fleming, Royal School of Mines, Prince Consort Road, London, S.W.7. This information must be received by October 15, 1961.

The official languages of the Congress will be French, English, Russian and German. Papers may be presented in any of these languages and, during the sessions, the discussions will be simultaneously translated into the other three languages.

During the week following the working sessions at Cannes, an extensive series of visits to mineral processing plants and laboratories in Mediterranean countries will be arranged. These will include technical tours in France, Yugoslavia, Italy, Morocco, Spain and Portugal.

VACANCIES WITH AN OPERATING GOLD MINE IN TANGANYIKA
for
A MILL FOREMAN

preferably a man who has had practical experience operating gold milling circuits,

and

A TECHNICAL ASSISTANT

a suitable appointment for a recent graduate, to perform test work in the mill laboratory.

Salary dependent on experience. The Company will provide free accommodation and passages for the employees and families. The appointments would be for an initial contract of thirty months followed by five months leave on full pay. Write, with copies of testimonials, to Box "N.R." c/o J. W. Vickers & Co. Ltd., 7 Great Winchester Street, London, E.C.2.

IDRIS HYDRAULIC TIN

The forty-seventh annual general meeting of Idris Hydraulic Tin, Ltd., was held on July 12 at 73 Cheapside, London, E.C.

Mr. A. G. Glenister, Chairman, presided, and the following is an extract from his circulated Statement:—

The profit for the year to December 31 1960, after charging a net amount of £3,675 for Taxation amounts to £45,124 which, with the balance of £19,880 brought forward from 1959 makes a total credit of £65,004. Dividends totalling 1s 4½d. per share less Income Tax have been paid in respect of the year and the Directors recommend a final dividend of 1½d. per share, leaving £20,904 to be carried forward.

During the year, 803,000 cubic yards of ground were treated at a cost of $0.73 (20.44d.) per cubic yard as compared with 256,600 cubic yards at a cost of $1.43 (40.04d.) per cubic yard for the previous year. The General Managers anticipate that satisfactory returns will be maintained during the current year.

Prior to the sale of the Kranji section the mine was divided into two sections, one at Batu Karang and one at Kranji, and that by far the greater proportion of the output was produced from the Kranji section. It is therefore interesting to note that 1960 marks a return to the standard of annual output formerly obtained from both the two sections over the eight years prior to the sale of Kranji.

Increased Malayan Taxation

The Malayan Government increased, with effect from January 1, 1961, the Tin ore export duty payable per picul, when the Singapore Tin price exceeds $388.50 per picul. The increase is equivalent to an additional duty payment of about 5% with Tin Metal at $400 per picul and above. The principle this embodies, besides running counter to assurances given to an already highly taxed industry, is prejudicial to the real intersts of both the industry and the country as a whole, and is therefore to be regretted. So much of the economy of Malaya is dependent upon the miner, the labour he employs and the revenue he provides, and it must be remembered that the miner has to set off the prospect of higher profits in good times against the lower returns and possible losses of the inevitable depressed periods, in order to justify the more than ordinary risks which he cannot avoid taking in searching for, developing and working what must always be a wasting asset. A high rate of Export duty bears particularly hardly upon the producer who has to work low-grade ground, for the duty is levied on all tin concentrates sold irrespective of the cost of production and without regard to whether there is a profit or loss to the miner. A great deal of the remaining mining land in Malaya is low-grade and, in many cases, it has become necessary to rework tailings from which the richer contents have already been extracted. In view of the difficulty of obtaining new mining land, it is essential that the lower grade tin-bearing deposits should be worked in order that Malaya may maintain and, if possible, increase its annual rate of tin production, together with the revenue and employment which its mining and ancillary industries provide.

New Tin Control Agreement

Restriction of permissible export was progressively eased during the year and was suspended altogether during the final quarter. This suspension continues and indications are that for some time to come world consumption of the metal is likely to exceed world production.

The first International Tin Agreement expired at the end of June and the new International Tin Agreement came into force as from July 1, 1961. With the ending of the old agreement the existing Buffer Stock is to be liquidated and repayment will be made in due course to the individual producers in Malaya in proportion to their share of the total contributions made by Malaya. In this connection, a valuation of the existing Buffer Stock cash and holdings is being made. From the information now available, the method of collection of the new Buffer Stock will be much on the same lines as that under the expiring agreement and will commence soon after the new agreement comes into force.

At an Extraordinary General Meeting held after the Annual General Meeting a resolution to increase the issued Share Capital to £128,000 by means of a bonus issue of one new share of 2s. for every three shares held, was duly carried.

42 TON DOZER FOR NAMAQUALAND

The biggest wheeled tractor dozer ever to be imported into South Africa was unloaded at Table Bay recently. The machine, a 42 ton Michigan 380, was bought in America for service on diamond prospecting in Namaqualand. The only other dozers of its size in Africa are in use in the Sahara. In the 380, weight of blade alone is 7,180 lb. and the U-frame is another 4,900 lb.

The 380 was bought for Namaqualand Ventures, a subsidiary of De Beers Consolidated Mines, Ltd., for approximately R52,000. It was imported by W. S. Thomas & Taylor Ltd., of Paarden Eiland, Cape Town. It is powered by a 12 cylinder, General Motors diesel engine of 430 b.h.p., which gives it a rim pull of more than 100,000 lb. The chassis and transmission are built by Clark Equipment Co. of Benton Harbour, Michigan, U.S.

Overall length of the dozer is 24 ft. 9 in., wheel-to-wheel width over the tyres is 12 ft. 2 in. and the height is 11 ft. 5 in. The blade is 14 ft. wide. Tyre size is 33.5 in. by 33 in., and the tyres stand 7 ft. high.

MINE SUPERINTENDENT

Bolani Ores Limited require an experienced Superintendent to take full operational and administration charge of their opencast iron ore Mines in North Orissa, India.

The successful applicant will be a man in the 40 to 48 age group who is in possession of the Associateship of the Roval, Camborne or Indian School of Mines and is a Corporate Member of a recognized Institution of Mining.

He will be responsible to the Management for the implementation of an expanding production programme through fully qualified Managers and Assistants and should have been continuously employed in production mining with at least five years experience in full charge of an important large scale opencast operation using mechanized methods.

It is essential that the person appointed should be a skilled and experienced administrator capable of organizing and leading a large staff and labour force and only applicants who have held the post of General Manager, Mines Superintendent or an equivalent designation previously can be considered.

The post will be permanent and will carry a substantial salary commensurate with the importance of the appointment and the qualifications and experience of the successful applicant.

Free furnished accommodation will be provided and the Company operate an attractive Superannuation and Provident Fund and also provide a free medical service.

Applications for this post should be sent in writing to The Directors Secretary, Bird & Co. (London) Ltd., 108 Cannon Street, London, E.C.4, and should include all relevant details of age, education, qualifications and previous mining and administrative experience.

Obituary

LYELL BRYANT ROBINSON

The passing of Mr. Lyell Bryant Robinson, who died suddenly this week, deprives the mining industry of one of its outstanding leaders. Mr. Robinson, who was 57, was chairman and managing director of Consolidated Zinc Corporation and of Comalco Industries, the newly integrated group of companies formed in association with Kaiser Aluminium to develop the aluminium industry in Australia, and was a director of other companies.

Born in Melbourne in 1904 and educated at Scotch College, Melbourne and Harrow, he went on to study engineering at Trinity College, Cambridge, but left eighteen months later without a degree on a world trip of mining and smelting centres. Joining his father, Mr. W. S. Robinson, as personal assistant, he served his industrial apprenticeship with the National Smelting Co. On the formation of Consolidated Zinc in 1949 he was appointed a vice-chairman and he had been chairman since 1956.

One of the greatest industrialists of the present day, Mr. Robinson, like his father, had played a major role in the development of Australia's natural resources. His untimely death is a great loss not only to the great complex of mining and industrial interests centralized in the Consolidated Zinc Corporation but also to the mining industry of Australia, where he was regarded as one of the leading industrialists.

Book Reviews

Proceedings of the Mining Congress, Budapest, Hungary, 1960, *KULTURA Pub. Dept., Budapest, 75 papers in 4 vol. ca. 1,600 pp., diagr., illus., German text*

The main purpose of the Congress was to contribute to mining knowledge and to promote a corporate spirit in the mining profession. There were 600 Hungarian and 200 foreign participants from 18 countries. The 75 papers presented during this congress by Hungarian and foreign experts dealt with coal mining, mechanization, rock-mechanics, mine support, metal mining practice, mineral technology, mine layout, mine safety, open pit problems, oil research and oil technology.

The results of recent advances in the application of rock pressure and seam structure to facilitate coal winning and recommendations on further research in this field were submitted by I. M. Petuchow. In the same group of papers a contribution by A. P. Sapadinski on the determination of the changes in stress in rocks will serve particularly well those concerned with deep mining problems. H. Richter described investigations into rock mechanics and roof bolting, and devoted great effort to the mathematical treatment of this subject. There were papers on deep mining problems in the Northern Urals with suggestions for improving present mining methods. I. A. Ostrouschko submitted results showing improvement of drilling speeds in hard rock.

Hungarian mining activities included papers on the development of mines and on mining methods, drainage, timbering, coal preparation with descriptions of different plants and geophysical prospecting including problems of oil technology in various oil fields.

It is certain that the proceedings will be as useful and interesting to the mining and mineral technology student, as they are to the practical miner faced with problems of ever rising costs, low grade deposits and a demand for higher output.

W. A. STEPEC.

Great Britain and Mexico in the Era of Porfirio Diaz, *by Alfred Tischendorf. Published by Duke University Press for whom Cambridge University Press act as agents. Price 40s.*

Anglo-Mexican relations were severed in 1867 and until 1884 no official intercourse existed between the two countries. Using diplomatic records, company files and other sources found in London and Mexico City, the author traces early efforts to achieve a rapprochement. Later chapters examine the investments and enterprise of British citizens during the era of Porfirio Diaz, the dictator who dominated Mexico from 1876 to 1911, when Britons invested their capital in more than 300 companies registered to operate in Mexico. Some investors profited; most did not. The story of the difficulties faced by British capitalists and technicians and of their attempts to obtain aid from the Foreign Office in London is not without interest.

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The Register of Fellows and Associates, and Graduate Members of the Royal Institute of Chemistry is now available from the Institute.

The group of chronic respiratory diseases included under the term "pneumoconiosis" represents a formidable challenge to all concerned with the welfare of miners and workers in allied industries. The Chest and Heart Association have published a report of meetings held on the subject in 1959 and 1960 under the title *Pneumoconiosis—modern trends.* This volume, price 18s. 6d. consists of eighteen chapters, each by a leading authority, on various aspects of this disease.

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A copy of Information Circular 8004, *Possible Uses for Bacteria in Metallurgical Operations,* can be obtained from the Publications-Distribution Section, Bureau of Mines, 4800 Forbes Ave., Pittsburgh 13, Pa. It was written by Joseph A. Sutton and John D. Corrick, both of College Park, Md.

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